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YEAR-BOOK
OF
THE ROYAL SOCIETY.
1902.

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YEAR-BOOK
OF THE
ROYAL SOCIETY OF LONDON.

1902.

LONDON :
HARRISON AND SONS, ST. MARTIN'S LANE,
Printers in Ordinary to His Majesty.
1902.

No. 6.

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1902

HARRISON AND SONS,
PRINTERS IN ORDINARY TO HIS MAJESTY,
ST. MARTIN'S LANE.

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MEMORANDUM AS TO THE WISHES OF THE COUNCIL IN RESPECT OF BENEFACTIONS TO THE SOCIETY.

From time to time since its foundation, the Royal Society has, through the generosity of benefactors, received funds, now amounting to a very considerable sum.

In the majority of cases the terms of gift have limited the application of the money to certain definite purposes, and, in particular, to the award of medals or other prizes for scientific discoveries or other contributions to the advancement of Natural Knowledge.

Every year the Council have to award several medals, including the Copley, Royal, Rumford, Davy, Darwin, Buchanan, Sylvester, and Hughes Medals, or some of these, and have been led by experience to the conclusion that it is neither to the advantage of the Society nor in the interests of the advancement of Natural Knowledge that this already long list of medals should in future be added to, and that, therefore, no further bequests to be awarded as prizes for past achievements should be accepted by the Society.

They desire, however, to make known that the funds belonging absolutely to the Society, funds tied down by no special directions as to their applications, funds which the Society are free to use for general purposes, are very few indeed. And the President and Council have again and again had the experience that the usefulness of the Society for the advancement of Natural Knowledge has been greatly hampered by the lack of funds of which they could freely make use according to their own judgment.

The President and Council are confident that it would not be difficult, wherever desirable, to associate in some conspicuous manner with any gift to the Society the name of the benefactor, and indeed they would wish to do so.

The President and Council accordingly desire to make it generally known that while they will willingly receive gifts to be applied to special objects or for the benefit of particular sciences indicated by the donors, they consider that, in view of the varying necessities of Science, the most useful benefactions are those which are given to the Society in general terms for the advancement of Natural Knowledge.

OF
THE ROYAL SOCIETY.
1902.

FIXTURES OF THE SOCIETY.

1902.

JANUARY	23.	Ordinary Meeting at 4.30 P.M.
"	30.	" " "
"	31.	Last day for receiving applications for Government Grants.
FEBRUARY	6.	Ordinary Meeting at 4.30 P.M.
"	13.	" " "
"	20.	" " "
"	27.	" " "
MARCH	6.	Last day for receiving certificates of Candidates for election.
"	6.	Ordinary Meeting at 4.30 P.M.
"	13.	" " "
"	20.	" " "
APRIL	24.	" " "
MAY	1.	" " "
"	15.	" " "
"	29.	" " "
JUNE	5.	Election of Fellows at 4 P.M.
"	5.	Ordinary Meeting at 4.30 P.M.
"	12.	" " "
"	19.	" " "
NOVEMBER	20.	" " "
"	27.	" " "
DECEMBER	1.	Anniversary Meeting at 4 P.M. (Monday).
"	4.	Ordinary Meeting at 4.30 P.M.
"	11.	" " "
"	31.	Last day for receiving Reports on Government Grants.

THE LIST OF THE ROYAL SOCIETY, JAN. 1, 1902.

HIS SACRED MAJESTY KING EDWARD VII., PATRON.

Date of Election.

1898.

HIS ROYAL HIGHNESS THE PRINCE OF WALES, K.G.

THE COUNCIL.

SIR WILLIAM HUGGINS, K.C.B., D.C.L., LL.D.—PRESIDENT.
ALFRED BRAY KEMPE, M.A.—TREASURER AND VICE-PRESIDENT.
PROF. SIR MICHAEL FOSTER, K.C.B., D.C.L., LL.D.—SECRETARY.
JOSEPH LARMOR, M.A., D.Sc., LL.D.—SECRETARY.
THOMAS EDWARD THORPE, C.B., Sc.D.—FOREIGN SECRETARY.

PROF. HENRY EDWARD ARM-
STRONG, LL.D.—VICE-PRESIDENT.
WILLIAM BATESON, M.A.
WILLIAM THOMAS BLANFORD,
LL.D.—VICE-PRESIDENT.
PROF. FREDERICK ORPEN
BOWER, Sc.D.
CHARLES VERNON BOYS.
PROF. WILLIAM BURNSIDE,
M.A.
PROF. WILLIAM WATSON
CHEYNE, C.B., M.B.
PROF. GEORGE CAREY FOSTER,
B.A.

RIGHT HON. SIR JOHN E. GORST
M.A.
PROF. WILLIAM MITCHINSON
HICKS, M.A.
PROF. HENRY ALEXANDER
MIERS, M.A.
PROF. J. EMERSON REYNOLDS,
Sc.D.—VICE-PRESIDENT.
ROBERT HENRY SCOTT, Sc.D.
PROF. CHARLES SCOTT SHER-
INGTON, M.D.
JOSEPH WILSON SWAN, M.A.
PROF. HERBERT HALL TURNER
M.A.

* * *This Council will continue till December 1, 1902.*

Assistant-Secretary and Librarian.

ROBERT W. F. HARRISON.

Clerk.

THEODORE E. JAMES.

Assistant Librarian.

A. HASTINGS WHITE.

Papers Clerk—RICHARD CHAPMAN.

GOVERNMENT GRANT.

Clerk to the Committee—FRANCIS A. TOWLE.

FELLOWS OF THE SOCIETY.

JANUARY 1, 1902.

Date of Election		Service Council
1860	Abel, Sir Frederick Augustus, Bart., K.C.B. G.C.V.O. D.C.L. (Oxon.) D.Sc. (Camb.) V.P.C.S. V.P.S. Arts.; Hon. Mem. Inst. C.E., Inst. M.E.; Ord. Imp. Bras. Rosae Eq.; Hon. Mem. Deutsch. Chem. Gesell.; Mem. Soc. d'Encourag. Paris; Hon. Sec. and Director of the Imperial Institute. Medal: Royal. 2 <i>Whitehall Court</i> , S.W.; and <i>Imperial Institute, Imperial Institute Road</i> , S.W.	1867 77 V. 1877
1876	Abney, Sir William de Wiveleslie, K.C.B. D.C.L. (Dunelm.) D.Sc. (Vict.) F.I.C. F.C.S. F.R.A.S., Principal Assistant Secretary, Board of Education, South Kensington, retired Capt. R.E. Medal: Rumford. <i>Measham Hall, Leicestershire</i> ; <i>Rathmore Lodge, Bolton Gardens South, Earl's Court</i> , S.W.; and <i>Athenæum Club</i> , S.W.	1883 91
1872	Adams, William Grylls, M.A. D.Sc. F.G.S. F.C.P.S. Vice-President of Physical Soc.; Past Pres. Inst. Elec. Eng.; Professor of Natural Philosophy and Astronomy in King's College, London. 43 <i>Camden Hill Square</i> , W.	1882 96
1889	Aitken, John, F.R.S.E. <i>Ardenlea, Falkirk</i> , N.B.	
1901	Alcock, Alfred William, Major I.M.S. M.B. LL.D. C.M.Z.S. Superintendent of the Indian Museum, and Professor of Zoology in the Medical College, Calcutta. <i>Indian Museum, Calcutta.</i>	
1880	Allbutt, Thomas Clifford, M.A. M.D. LL.D. D.Sc. F.L.S. Regius Professor of Physic in the University of Cambridge. <i>St. Radegund's, Cambridge.</i>	1896
1884	Allman, George Johnston, LL.D. D.Sc., late Professor of Mathematics in Queen's College, Galway; Member of Senate of the Royal University of Ireland. <i>St. Mary's, Galway.</i>	
1888	Andrews, Thomas, F.R.S.E. F.C.S. Mem. Inst. C.E., Telford Medallist and Prizeman, Inst. C.E., Bessemer Prizeman, Soc. Engineers. <i>Ravencrag, Wortley, near Sheffield.</i>	
1876	Armstrong, Henry Edward—Vice-President—Ph.D. (Lips.) LL.D. (St. Andr.) Past Pres. Chem. Soc. Professor of Chemistry at the City and Guilds of London Central Technical College, South Kensington; Hon. Mem. Pharm. Soc. Lond. 55 <i>Granville Park, Lewisham</i> , S.E.; and <i>Athenæum Club</i> , S.W.	1888 1900 V. 1901
1880	Attfield, John, M.A. Ph.D. (Tüb.) F.I.C. F.C.S., late Professor of Practical Chemistry to the Pharmaceutical Society of Great Britain, Hon. Mem. Amer. Pharm. Assoc., Colls. Pharm. Philad., New York, Mass., Chic., Ontario, and Pharm. Assocs. Liverp.,	

Manch., Maryland, Virg., Georgia, New Hampshire, and Quebec;
Hon. Corresp. Mem. Soc. Pharm. Paris; Hon. Mem. Pharm. Soc.
Gr. Brit., New South Wales, St. Petersburg, Austria, Denmark, East
Flanders, Switzerland, Queensland, and Australasia. *Ashlands,*
Watford, Herts.

- 1858 Avebury, Right Hon. John Lubbock, Lord, D.C.L. (Oxon.) LL.D. 1861-
(Cantab., Dubl. et Edin.) M.D. (Würzb.) V.P.L.S. F.G.S. F.Z.S.
F.S.A. F.E.S. Trust. Brit. Mus.; Assoc. Acad. Roy. des Sci. Brux.;
Hon. Mem. R. Irish Acad., N.Z. Inst., Amer. Ethnol. Soc.,
Anthrop. Soc. Wash. (U.S.), Brux., Firenze, Anthrop. Verein
Graz., Soc. Entom. de France, Allgem. Entomol., Gesell., Soc.
Géol. de la Suisse, and Soc. Helvét. des Sci. Nat.; Mem. Amer.
Phil. Soc. Philad., K. Vetensk. Soc. Upsala, and Soc. d'Ethn. de
Paris; Corresp. Mem. Soc. Nat. des Sci. Nat. de Cherb., Berl.
Gesell. für Anthrop., Soc. Romana di Antrop., Soc. d'Emul.
d'Abbeville, Soc. Cient. Argentina, Soc. de Géog. de Lisb., Acad.
Nat. Sci. Philad., Numis. and Ant. Soc. Philad., Amer. Entom. Soc.,
Soc. Españ. de Hist. Nat.; For. Assoc. Mem. Soc. d'Anthrop. de
Paris; For. Mem. Amer. Antiq. Soc., K. Svenska Vetensk.-Akad.
High Elms, Down, Kent.
- 1881 Ayrtton, William Edward, Past Pres. Phys. Soc. and Inst. Elect. Eng.; 1889-
Professor of Electrical Engineering in the Central Technical
College of the City and Guilds of London Institute. **Medal:**
Royal. *Exhibition Road, S.W.; and 41 Kensington Park*
Gardens, W.
- 1885 Baird, Andrew Wilson, C.S.I. Colonel R.E. *Palmers' Cross, Elgin,*
N.B.; and East India United Service Club, S.W.
- 1890 Baker, Sir Benjamin, K.C.M.G. LL.D. M.E. (Dubl.) Mem. Inst. C.E.; 1892-
Hon. Mem. Amer. Soc. Mechan. Engs., Soc. of Engs., and Lit. and
Phil. Soc. Manchester. *2 Queen Square Place, Queen Anne's Man-*
sions, Westminster; and Athenæum Club, S.W.
- 1898 Baker, Henry Frederick, Sc.D. Fellow and Lecturer of St. John's
College, Cambridge, and University Lecturer in Mathematics.
4 Belvoir Terrace, Trumpington Road, Cambridge.
- 1878 Baker, John Gilbert, F.L.S. late Keeper of the Herbarium, Royal 1883
Gardens, Kew. *3 Cumberland Road, Kew.*
- 1888 Balfour, Right Hon. Arthur James, D.C.L. *10 Downing Street, S.W.;*
and Whittingehame, Prestonkirk, N.B.
- 1884 Balfour, Isaac Bayley, D.Sc. M.D. (Edin.) M.A. (Oxon.) F.R.S.E. 1892
F.L.S. F.G.S. Keeper of the Royal Botanic Garden, Edinburgh,
Queen's Botanist in Scotland, and Professor of Botany in the
University of Edinburgh; Corresp. Mem. Deutsch. Bot. Gesell.,
Soc. Nat. des Sci. Nat. et Math. Cherbourg, New York Acad. Sci.
Inverleith House, Edinburgh; and Athenæum Club, S.W.
- 1873 Ball, Sir Robert Stawell, Kt., Hon. M.A. (Cantab.) LL.D. F.R.A.S. 1897
M.R.I.A. Hon. Mem. Phil. Soc. Camb. and Roy. Soc. Edin.
Lowndean Professor of Astronomy and Geometry in the University

- Club, S.W.
- 1850 Barlow, William Henry, F.R.S.E. Past Pres. Inst. C.E. *High Combe, Old Charlton, Kent.* 188
- 1899 Barrett, William F., F.R.S.E. M.R.I.A. Professor of Experimental Physics in the Royal College of Science for Ireland. 6 *De Vesce Terrace, Kingstown, Co. Dublin.* 188
- Barry (see Wolfe Barry).
- 1889 Basset, Alfred Barnard, M.A. *Fledborough Hall, Holyport, Berks.*
- 1868 Bastian, Henry Charlton, M.A. M.D. F.L.S. Coll. Reg. Med. Soc. Emeritus Professor of the Principles and Practice of Medicine, University College; Consulting Physician to University College Hospital; Fellow of Univ. Coll. London; Hon. M.D. Royal University, and Hon. Fellow Roy. Coll. Phys., Ireland; Corr. Mem. Roy. Acad. Med. Turin, Med. Chir. Soc. Bologna, and Soc. Psychol. Physiolog. Paris. 8A *Manchester Square, W.*
- 1894 Bateson, William, M.A., Fellow of St. John's College, Cambridge. 190
Merton House, Grantchester, Cambridge.
- 1857 Beale, Lionel Smith, M.B. Coll. Reg. Med. Soc. Emeritus Prof. of the Principles and Practice of Medicine, late Prof. of Physiology and of General and Morbid Anatomy in King's College, London, and Physician to the Hospital; Government Medical Referee for England. 61 *Grosvenor Street, W.* 186
- 1892 Beddard, Frank Evers, M.A. (Oxon.) F.R.S.E. F.Z.S. F.E.S. Vice-Secretary and Prosector of the Zoological Society. *Zoological Society's Gardens, Regent's Park, N.W.*
- 1873 Beddoe, John, M.D. F.R.C.P. LL.D. (Edin.) B.A., Officier (1^{re} classe) de l'Instr. Publ. France; Vice-Pres. Anthropol. Inst.; Corresp. Mem. Anthropol. Soc. Berlin; and Soc. Romana di Antrop.; For. Assoc. Mem. Soc. Anthropol. Paris; Hon. Mem. Nat. Hist. Soc. Bristol, Philos. Inst. Bath, Anthropol. Soc. Brussels and Washington, Acad. Anthropol. New York, Amer. Antiq. Soc., Hist. Soc. Dallas, Texas, and of Imp. Soc. Friends of Sci., Moscow. *The Chantry, Bradford-on-Avon; and Athenæum Club, S.W.*
- 1874 Bell, Sir Lowthian, Bart., F.C.S. Mem. Inst. C.E., Mem. Inst. M.E., 188
Mem. Iron and Steel Inst. *Rounton Grange, by Northallerton.*
- 1884 Bell, James, C.B. D.Sc. (Dubl.) Ph.D. F.I.C., late Principal of the Inland Revenue Laboratory, Somerset House. 52 *Cromwell Road, Hove, Brighton.*
- 1897 Bell, Robert, M.D. D.Sc. LL.D. Director of the Geological Survey of Canada. *Ottawa, Canada.*
- 1871 Besant, William Henry, Sc.D. F.R.A.S. F.C.P.S. Fellow of St. John's College, Cambridge. *St. John's College, and Spring Lawn, Harvey Road, Cambridge.*
- 1886 Bidwell, Shelford, M.A. Sc.D. LL.B. *Riverstone Lodge, Southfields, Wandsworth, S.W.*

- 1874 **Blanford, William Thomas—Vice-President—LL.D.** (Univ. McGill) 1891–
A.R.S.M. F.G.S. F.R.G.S. F.Z.S. Ord. SS^{rum}. Maur. et Lazar. 1901–
Ital. Eq.; Soc. Asiat. Beng. Soc. Honor. **Medal: Royal.** V.P.
72 *Bedford Gardens, Campden Hill, Kensington, W.* 1892–
1901–
- 1878 **Bonney, Rev. Thomas George, D.Sc. LL.D.** (Univ. McGill) Sc.D. 1880–
(Dubl.), F.S.A. F.G.S. Soc. Phil. Cantab. Soc.; Acad. Reg. Hib. 18
et Ebor. Soc. Honor.; Soc. Géol. Belg. et Soc. Reg. Canard. 97–
Corresp.; Corresp. Mem. Soc. Géol. du Nord de France; Hon. V.P.
Canon of Manchester; late Professor of Geology in University 1898–
College, London. 23 *Denning Road, Hampstead, N.W.*
- 1899 **Booth, Charles, Hon. Sc.D. (Camb.).** 24 *Great Cumberland Place, W.*
- 1890 **Bosanquet, Robert Holford Macdowall, M.A.** Fellow of St. John's
College, Oxford. *Castillo Zamora, Realejo-Alto, Teneriffe.*
- 1888 **Bottomley, James Thomson, M.A. D.Sc. F.R.S.E. F.C.S.** 13 *Univer-*
sity Gardens, Glasgow.
- 1894 **Boulenger, George Albert, F.Z.S. Corresp. Mem. R. Accad. d. Sci.,**
Turin. Acad. Sci., New York, Imp. Soc. Friends of Sci., Moscow,
Senckenb. Soc. Frankfort, Linn. Soc. Bordeaux, Sci. Soc. Boston,
Mus. Nat. Para, Nat. Ver., Magdeburg, Hon. Mem. Soc. Sci.
Chili. 8 *Courtfield Road, South Kensington, S.W.; and British*
Museum (Nat. History).
- 1895 **Bourne, Alfred Gibbs, D.Sc.** Professor of Biology in the Presidency
College, Madras. Fellow of University College, London. *Presi-*
dency College, Madras.
- 1891 **Bower, Frederick Orpen, D.Sc. (Camb.) F.L.S. F.R.S.E.** Regius 1901–
Professor of Botany in the University of Glasgow. 1 *St. John's*
Terrace, Hillhead, Glasgow.
- 1888 **Boys, Charles Vernon, A.R.S.M. Officier de l'Instr. Publ. France,** 1900
Hon. Mem. New York Acad. Sci. **Medal: Royal.** 27 *The Grove,*
Boltons, S.W.
- 1894 **Bradford, John Rose, M.D. D.Sc.** Physician to University College
Hospital; Professor of Materia Medica in University College;
Professor Superintendent of the Brown Institution, London.
8 *Manchester Square, W.*
- 1882 **Brady, George Stewardson, M.D. LL.D. D.Sc.** Professor of Natural
History in the Durham College of Science, Newcastle. *Mowbray*
Villa, Sunderland.
- 1873 **Bramwell, Sir Frederick Joseph, Bart., D.C.L. (Oxon et Dunelm)** 1877
LL.D. (Cantab. et Univ. McGill) M. Inst. C.E. 5 *Great George*
Street, Westminster, S.W.
- 1875 **Brandis, Sir Dietrich, K.C.I.E. Ph.D. LL.D. (Edin.) F.L.S.,** late
Inspector General of Forests to the Government of India. *Bonn,*
Germany.
- 1897 **Broadbent, Sir William Henry, Bart., K.C.V.O. M.D. (Lond.) LL.D.**
(Edin. St. Andr.) F.R.C.P. Physician in Ordinary to the King,
and to H.R.H. the Prince of Wales; Consulting Physician to
St. Mary's Hospital, and to the London Fever Hospital. 84 *Brook*
Street, W.

- the University of Edinburgh. 8 *Belgrave Crescent, Edinburgh.*
- 1898 Brown, Ernest William, M.A. Sc.D. Professor of Mathematics in Haverford College. *Haverford College, Haverford, Pennsylvania, U.S.A.*
- 1889 Brown, Horace T., LL.D. (Edin.) F.C.S. F.I.C. F.G.S. F.L.S. 1899 52 *Nevern Square, Kensington, S.W.*
- 1883 Browne, Sir James Crichton, Kt., M.D. LL.D. F.R.S.E. 61 *Carlisle Place Mansions, Victoria Street, S.W.*
- 1899 Bruce, David, M.B., Lieut.-Colonel R.A.M.C. 74, *Queen's House, St. James' Court, Buckingham Gate, S.W.*
- 1874 Brunton, Sir T. Lauder, M.D. Sc.D. LL.D. (Edin.) Hon. LL.D. 188 (Aberdeen) Coll. Reg. Med. Soc. 10 *Stratford Place, Oxford Street, W.; and Athenæum Club.*
- 1895 Bryan, George Hartley, Sc.D. Professor of Mathematics in the University College of North Wales. *Plas Gwyn, Bangor, N. Wales.*
- 1893 Bryce, Right Hon. James, D.C.L. Hon. Fellow, Trinity and Oriel 1899 Colleges, Oxford; Corr. Mem. Inst. de France; Acad. Roy. des Sci. Brux.; R. Accad. delle Sci. Torino, Soc. Romana di Storia Patria; Massachusetts Hist. Soc. 54 *Portland Place, W.*
- 1898 Buchan, Alexander, M.A. LL.D. F.R.S.E. Sec. Scott. Meteorol. Soc. 42 *Heriot Row, Edinburgh.*
- 1887 Buchanan, John Young, M.A. F.R.S.E. F.C.S. F.R.G.S. *Christ's College, Cambridge.*
- 1857 Buckton, George Bowdler, F.C.S. F.E.S. F.L.S. Corr. Acad. Nat. Sci. 186 Philad.; Mem. Soc. Entom. France. *Weycombe, Haslemere, Surrey.*
- 1879 Buller, Sir Walter Lawry, K.C.M.G. D.Sc. (Cantab.) F.L.S. Corr. Mem. Z.S. c/o *Agent-General for New Zealand, 13 Victoria Street, S.W.*
- 1890 Burbury, Samuel Hawksley, M.A. 17 *Upper Phillimore Gardens, Kensington, W.*
- 1900 Burch, George James, M.A. 20 *Museum Road, Oxford.*
- 1893 Burnside, William, M.A. D.Sc. (Dubl.) Hon. Fellow of Pembroke College, 1900 Cambridge; Professor of Mathematics, Royal Naval College, Greenwich. *The Croft, Bromley Road, Catford, S.E.*
- 1894 Callendar, Hugh Longbourne, M.A., late Fellow of Trinity College, Cambridge; Professor of Physics at the Royal College of Science, London; LL.D. (McGill Univ.) F.R.S. (Canada). 2 *Chester Place, Regent's Park, N.W.*
- 1871 Carruthers, William, F.L.S. F.G.S. F.R.S.E. Fell. Bot. Soc. Edin.; 1877 Corresp. Mem. Acad. Nat. Sci. Philad., New York Acad. Sci., Ist. Ven. Sci. Lett. ed Art., Soc. Bot. Copenh., Soc. Géol. Belg.; Hon. Memb. Manch. Lit. and Phil. Soc., Whitby Lit. and Phil. Soc., Chester Nat. Hist. Soc., Nat. Hist. Soc. Glasg., Dumf. and Gall. Nat. Hist. and Antiq. Soc.; Pres. Roy. Micros. Soc.; Past Pres. Linn. Soc.; late Keeper Botanical Department, British

- Museum; Consulting Botanist, Royal Agricultural Society of England. 14 *Vermont Road, Norwood, S.E.*
- 1887 Cash, John Theodore, M.D. Regius Professor of Materia Medica in the University of Aberdeen. *Marischal College, Aberdeen.*
- 1882 Chamberlain, Right Hon. Joseph, D.C.L. (Oxon.) LL.D. (Cantab. Glasg. Dubl.) Chancellor of the University of Birmingham. 40 *Prince's Gardens*; and *Athenæum Club, S.W.*
- 1894 Cheyne, William Watson, C.B. M.B. C.M. (Edin.) F.R.C.S. (Eng.) 1901
Professor of Surgery in King's College, London. 75 *Harley Street, W.*
- 1897 Chree, Charles, M.A. Sc.D. (Camb.) LL.D. (Aberd.) Superintendent of the Observatory Department of the National Physical Laboratory. *Old Deer Park, Richmond, Surrey.*
- 1881 Christie, William Henry Mahoney, C.B. M.A. Astronomer Royal, 1883
F.R.A.S. F.R. Met. Soc. Corr. Mem. Acad. Sci. Paris, and Imp. 89
Acad. Sci. St. Petersburg; For. Memb. Roy. Acad. Sci. Palermo; 1900
Corr. Mem. Soc. Spettros. Ital., and Soc. Nationale des Sci. Nat. et V.I.
Math. Cherbourg. *Royal Observatory, Greenwich, S.E.* 1890
1900
- 1888 Church, Arthur Herbert, M.A. D.Sc. (Oxon.) F.S.A. F.C.S. F.I.C. Professor of Chemistry in the Royal Academy of Arts; Past President of the Mineralogical Society. *Shelsley, Kew Gardens.*
- 1888 Clarke, Alexander Ross, Colonel R.E. C.B. Hon. F.C.P.S. Hon. F.R.S.E. Corr. Mem. Imp. Acad. Sci. St. Petersburg. **Medal: Royal.**
Boldrewood, Redhill, Surrey.
- 1882 Clarke, Charles Baron, M.A. (Cantab.) F.L.S. F.G.S. 13 *Kew* 1888
Gardens Road, Kew.
- 1896 Clarke, Sir George Sydenham, Lieut.-Colonel R.E. K.C.M.G. Governor of the State of Victoria in the Commonwealth of Australia. 13 *Gledhow Gardens, South Kensington, S.W.*
- 1872 Cleland, John, M.D. D.Sc. LL.D. Professor of Anatomy in the 1897
University of Glasgow. *University, Glasgow.*
- 1848 Clerk, Henry, Major-General R.A. "Mountfield," 5 *Upper Maze* 1878
Hill, St. Leonards-on-Sea.
- Clifford Allbutt (*see* Allbutt).
- 1868 Clifton, Robert Bellamy, M.A. (Cantab. et. Oxon.) F.R.A.S. Pro- 1871
fessor of Experimental Philosophy in the University of Oxford; 85
Soc. Lit. Phil. Manc. Soc. Honor. 3 *Bardwell Road, Banbury* 96
Road, Oxford; and *Athenæum Club.* V.I.
1896
- 1896 Collie, J. Norman, Ph.D. F.C.S. Professor of Chemistry to the Pharmaceutical Society of Great Britain. 16 *Campden Grove, Kensington, W.*
- 1885 Common, Andrew Ainslie, F.R.A.S. LL.D. (St. And.) 63 *Eaton* 1893
Rise, Ealing, W.
- 1878 Cotterill, James Henry, M.A., late Professor of Applied Mechanics, Royal Naval College, Greenwich. 15 *St. Alban's Mansion, Ken-
sington Court Gardens, W.*

- Mus., Leg. Honor. Com.; Ord. Imp. Bras. Rosae Com.; Acad. Reg. Sci. Berol. Soc. Honor. 2 *Cavendish Square, W.*; and *Haigh Hall, Wigan.*
- 1885 Creak, Ettrick William, C.B. Captain R.N. M. Inst. Elect. Eng. 19 *Hervey Road, Blackheath, S.E.*
- 1868 Crofton, Morgan William, D.Sc. Fellow of the Royal University of Ireland.
- 1863 Crookes, Sir William. Past Pres. Chem. Soc. and Inst. Elect. Eng. **Medals: Royal, Davy.** 7 *Kensington Park Gardens, W.*; and *Athenæum Club, S.W.*
- 1879 Cross, Right Hon. Richard Assheton, Viscount, G.C.B. G.C.S.I. D.C.L. LL.D. 12 *Warwick Square and Athenæum Club, S.W.*; and *Eccle Riggs, Broughton-in-Furness, Lancashire.*
- 1891 Cunningham, Daniel John, M.D. (Edin. and Dubl.), D.Sc. D.C.L. LL.D. Professor of Anatomy in the University of Dublin. 43 *Fitzwilliam Place, Dublin.*
- 1889 Cunningham, David Douglas, M.B. C.M. (Edin.) C.I.E. F.L.S. C.M.Z.S. Lieut.-Col. Bengal Medical Service (retired); late Honorary Surgeon to the Viceroy of India; late Professor of Physiology in the Medical College; and Fellow of the University of Calcutta. *Torre Mount, Torquay.*
- 1898 Curzon of Kedleston, George Nathaniel, Lord. *Government House, Calcutta.*
- 1880 Dallinger, Rev. William Henry, LL.D. Sc.D. (Dubl.) D.D. (Durh.) F.L.S. Vice-Pres. R.M.S.; Hon. Mem. Amer. Micros. Soc. *Ingleside, Newstead Road, Lee, S.E.*
- 1882 Darwin, Francis, M.A. and M.B. (Cantab.) F.L.S. F.Z.S. Fellow of Christ's College, and Reader in Botany in the Univ. of Cambridge. Mem. Soc. Nat. Sci. et Math. de Cherbourg. *Wychefield, Huntingdon Road, Cambridge.*
- 1879 Darwin, George Howard, M.A. LL.D. (Glasg.) Sc.D. (Dubl.) Ph.D. (Padua, Gött.) Hon. Mem. Univ. Padua; F.R.A.S. F.M.S. Hon. F.R.S.E. Hon. Mem. R.I.A.; Fellow of Trinity College, and Plumian Professor of Astronomy and Experimental Philosophy in the University of Cambridge; For. Mem. R. Accad. dei Lincei, Rome; and Amer. Acad. Arts and Sci.; Hon. Fell. Astron. and Phys. Soc. Toronto. R. Accad. di Sci. Lett. ed. Arti, Padua; Hon. Mem. New York Acad. Sci.; Mem. Amer. Philos. Soc. Philad.; Corr. Mem. Accad. de' Zelanti, Acireale. **Medal: Royal.** *Newnham Grange, Cambridge.*
- 1895 Davey, Right Hon. Horace, Lord, M.A. D.C.L. 86 *Brook Street, W.*; and *Verdley Place, Fernhurst, Sussex.*
- 1900 David, T. W. Edgeworth, B.A. (Oxon.) F.G.S. Professor of Geology in the University of Sydney. *The University, Sydney, N.S.W.*
- 1867 Dawkins, W. Boyd, M.A. D.Sc. (Oxon.) F.S.A. F.G.S. Assoc. Inst. C.E. Hon. Fellow of Jesus Coll. (Oxford); Professor of Geology

- and Palaeontology in the Victoria University, Owens Coll. Manchester; Soc. Anthropol. Berol., Acad. Sci. Nat. Philad. et Soc. Nat. Hist. Bost. Corresp. Soc. Phil. Amer. et Acad. Sci. Nov. Ebor. et Soc. Geol. Belg. Soc. Honor. *Woodhurst, Falloufield, Manchester; and Athenæum Club, S.W.*
- 1861 Debus, Heinrich, Ph.D. F.C.S., late Prof. of Chemistry at the Royal Naval College, Greenwich, and Lecturer at Guy's Hospital. 1870
4 *Schlangenweg, Cassel, Hessen, Germany.* 81
- 1892 Devonshire, Spencer Compton Cavendish, Duke of, K.G. M.A. LL.D. Hon. Mem. Inst. C.E. Chancellor of the University of Cambridge. *Devonshire House, Piccadilly, W.; and Chatsworth, Derbyshire.*
- 1877 Dewar, James, M.A. V.P.C.S. F.I.C. F.R.S.E. Hon. LL.D. (Edin., 1885
Glasg. and St. And.) D.Sc. (Vict.) Hon. Mem. Inst. C.E., Lit. and 1898-
Phil. Soc. Manc., Pharm. Soc. Lond., Phil. Soc. Philad., Phil. Soc. V.
Glasg., Soc. Phys. Verein, Frankfurt, R. Ist. Lomb. di Scienze, 1899-
Lettere ed Arti, Milan; Fellow of Peterhouse College, Cambridge;
Jacksonian Prof. of Natural Experimental Philosophy in the
University of Cambridge; Fullerton Prof. of Chemistry in the
Royal Institution. **Medal: Rumford.** 1 *Scroope Terrace, Cambridge; and Royal Institution, Albemarle Street, W.*
- 1885 Divers, Edward, M.D. Emeritus Professor of Chemistry in the Imperial University, Japan; Second Class, Order Sacred Mirror; Third Class, Order Rising Sun, Japan. 9 *Rugby Mansions, Kensington, W.*
- 1886 Dixon, Harold Bailly, M.A. F.C.S. Professor of Chemistry and Director of the Chemical Laboratories in Owens College, Manchester. *Owens College, Manchester; Beechey House, Victoria Park, Manchester.*
- 1896 Downing, Arthur Matthew Weld, M.A. D.Sc. (Dubl.) F.R.A.S. F.R.G.S. Superintendent of the Nautical Almanac: Hon. Mem. Astron. Phys. Soc. Toronto. 3 *Granville Park, S.E.*
- 1855 Ducie, Henry John Moreton, Earl of, F.G.S. *Tortworth Court, Falfield, Gloucestershire.*
- 1865 Dufferin and Ava, Frederick Temple Blackwood, Marquis of, K.P. G.C.B. G.C.M.G. G.C.S.I. G.M.I.E. D.C.L. (Oxford) LL.D. (Camb. and Dubl.) F.R.G.S. *Clandeboye, Co. Down, Ireland.*
- 1893 Dunstan, Wyndham R., M.A. (Oxon.) Sec. Chem. Soc. F.I.C. Director of the Scientific and Technical Department of the Imperial Institute. *Imperial Institute, S.W.*
- 1875 Dupré, August, Ph.D. (Heidelb.) F.C.S. F.I.C. Emeritus Professor of Chemistry to the Westminster Hospital. 2 *Edinburgh Mansions, Howick Place, Westminster, S.W.; and Mount Edgcumbe, Benhill Road, Sutton, Surrey.*
- Dyer (see Thiselton-Dyer).
- 1901 Dyson, Frank Watson, M.A. (Cantab.) Sec. R.A.S. Chief Assistant at the Royal Observatory, Greenwich. 6 *Vanbrugh Hill, Blackheath, S.E.*
- 1895 Elgar, Francis, LL.D. (Glasg.) F.R.S.E. F.S.A. Mem. Inst. C.E.;

Architecture in the University of Glasgow. 18 *York Terrace, Regent's Park, N.W.*

- 1895 Eliot, John, C.I.E. M.A. Meteorological Reporter to the Government of India, and Director-General of Indian Observatories. *Indian Meteorological Office, Simla.*
- 1873 Ellery, Robert Lewis John, C.M.G. F.R.A.S., late Government Astronomer, and Director of the Observatory. *Melbourne, Victoria.*
- 1891 Elliott, Edwin Bailey, M.A. F.R.A.S. Waynflete Professor of Pure Mathematics in the University of Oxford; Fellow of Magdalen College, Oxford. 4 *Bardwell Road, Oxford.*
- 1893 Ellis, William, F.R.A.S. F.R. Met. Soc. Memb. Inst. Elect. Eng. late Superintendent of the Magnetical and Meteorological Department, Royal Observatory, Greenwich. 12 *Vanbrugh Hill, Blackheath, S.E.*
- 1897 Elwes, Henry John, F.L.S. F.Z.S. F.E.S. *Colesborne Park, near Cheltenham.*
- 1869 Esson, William, M.A. F.C.S. F.R.A.S. Savilian Professor of Geometry in the University of Oxford, Fellow of New College, Senior Bursar of Merton College. *Merton College; and 13 Bradmore Road, Oxford.*
- 1871 Etheridge, Robert, F.R.S.E. F.G.S. Hon. Memb. Geol. Soc. Belg., N.Z. Inst., Roy. Geol. Soc. Cornwall, Phil. Soc. York, Bristol; Corresp. Imp. Geol. Inst. Vienna. 14 *Carlyle Square, Chelsea, S.W.*
- 1901 Evans, Arthur John, M.A. LL.D. (Edin.) D. Litt. (Dubl.) V.P.S.A. Fellow of Brasenose College, and Keeper of the Ashmolean Museum, Oxford. *Youlbury, Oxford.*
- 1864 Evans, Sir John, K.C.B. D.C.L. (Oxon., and Trin. Coll. Toronto), LL.D. (Dubl. and Toronto) Sc.D. (Camb.) Trust. Brit. Mus. F.S.A. F.L.S. F.G.S. F.C.S. F.Z.S. Assoc. I.C.E. Pres. Num. Soc. Hon. M.R.I.A. Hon. F.S.A. (Scot.) Comm. of the Ord. of St. Thiago of Port.; Corresp. Inst. de France (Acad. des Insc.); Hon. Mem. of the Amer. Phil. Soc., Amer. Acad. Arts and Sciences, Amer. Ethnol. Soc., Num. and Ant. Soc. of Philadelphia, Amer. Num. and Archaeol. Soc. Anthropol. Soc. Washington, Soc. Franç. de Numism., Acad. d'Archéol. de Belg., Soc. Géol. de Belg., Soc. Num. de Belg., Soc. Ital. d'Anthrop., Acad. Sci. and Num. Soc. Sweden, Soc. Roy. Gr. Duc. de Luxembourg, Soc. Anthropol. de Brux, et de Lyons, Soc. de Borda. Dax., Soc. Polym. du Morbihan, Soc. Suisse de Numism. and Archaeol. Soc. of Athens; For. Mem. of the Soc. Ant. of Sweden, Soc. Anthropol. de Paris, and the Numism. Soc. of the Netherlands; Corr. Mem. of the Acad. Sci. Bologna, Soc. Romana di Antrop., Inst. di Corr. Arch., Acad. Valdarn., Anthropol. Soc. of Berlin, and Soc.

- d'Emul. d'Abbeville. *Nash Mills, Hemel Hempstead; and Athenæum Club.*
- 1879 Everett, Joseph David, M.A. D.C.L. F.R.S.E. late Professor of Natural Philosophy in Queen's College, Belfast. 11 *Leopold Road, Ealing, W.*
- 1893 Ewart, James Cossar, M.D. Professor of Natural History in the University of Edinburgh. *The University, Edinburgh.*
- 1887 Ewing, James Alfred, Hon. M.A. (Camb.) LL.D. (St. And.) F.R.S.E. 1899
M. Inst. C.E. Professor of Mechanism and Applied Mechanics in the University of Cambridge; Corresp. Reale Accad. Sci. Turin. **Medal: Royal.** *Langdale Lodge, Cambridge.*
- 1900 Farmer, John Bretland, M.A. (Oxon.) F.L.S. Professor of Botany in the Royal College of Science, London. *Claremont House, Wimbledon Common.*
- 1866 Farrar, Very Rev. Frederic William, M.A. D.D. (Cantab.) Dean of Canterbury. *The Deanery, Canterbury.*
- 1877 Fayrer, Sir Joseph, Bart. K.C.S.I. Surgeon-General K.H.P. LL.D. 1899
(Edin. and St. And.) M.D. F.R.C.P. (Lond.) F.R.C.S. (Eng. and Edin.) F.R.S.E. Physician Extraordinary to the King. 16 *Devonshire Street, Portland Place, W.*
- 1899 Fenton, Henry John Horstman, M.A. (Camb.) 7 *Mortimer Road, Cambridge.*
- 1877 Ferrers, Rev. Norman Macleod, D.D. Master of Gonville and Caius College, Cambridge. *The Lodge, Gonville and Caius College, Cambridge.*
- 1876 Ferrier, David, M.A. (Aberd.) M.D. (Edin.) LL.D. F.R.C.P. Pro- 1899
fessor of Neuro-pathology, King's College, London. **Medal: Royal.** 34 *Cavendish Square, W.; and Athenæum Club, S.W.*
- 1886 Festing, Edward Robert, C.B. Major-General, R.E. (retired). Science Museum Director, Victoria and Albert Museum. 30 *Queen's Gate Terrace, S.W.*
- 1892 Fleming, John Ambrose, M.A. (Camb.) D.Sc. (Lond.) late Fellow of St. John's College, Cambridge; Fellow and Professor of Electrical Engineering in University College, London. *University College, Gower Street, W.C.*
- 1889 Fletcher, Lazarus, M.A. (Oxon.) F.G.S. F.C.S. Keeper of Minerals 1899
in the British Museum. *Natural History Museum, Cromwell Road; and 36 Woodville Road, Ealing, W.*
- 1887 Forbes, George, M.A. F.R.S.E. F.R.A.S. Mem. Inst. C.E. M.I.E.E. Chev. Lég. Honor. Memb. Astron. Gesell. Vienna, Amer. Phil. Soc., and Franklin Inst.; formerly Professor of Nat. Phil. in Anderson's College, Glasgow. 34 *Great George Street, S.W.*
- 1886 Forsyth, Andrew Russell, M.A. Sc.D. (Camb.) Hon. Sc.D. (Dubl. Vict.) 1899
Hon. LL.D. (Glasg.) F.C.P.S. F.R.A.S. Hon. F.R.S.E. Hon. Mem. Lit. Phil. Soc. Manch., Soc. Corr. R. Ist. Lomb.; Sadlerian Professor of Pure Mathematics in the University of Cambridge; Fellow of Trinity College, Cambridge. **Medal: Royal.** *Trinity College, Cambridge; and Athenæum Club, S.W.*

- 1892 Foster, Clement Le Neve, B.A. D.Sc. (Lond.) F.G.S. A.R.S.M. Professor of Mining in the Royal College of Science, London. *Lady's College of Science, South Kensington, S.W.*
- 1869 Foster, George Carey, B.A. LL.D. F.C.S. Principal of, and Professor of Physics in, University College, London. *Lady's Rickmansworth, Herts; and Athenæum Club, S.W.*
- 1872 Foster, Sir Michael, K.C.B.—**Secretary**—M.D. B.A. (Lond.) M.A. (Cantab.) D.C.L. (Oxon.) LL.D. (Glasg., St. And. and U. McGill) Sc.D. (Dubl.) F.L.S. F.C.S. For. Mem. R. Accad. Lincei, Roma, R. Accad. delle Scienze, Torino, Amer. Acad. Corresp. Étrang. Acad. Roy. de Méd. Belg.; Hon. Mem. Roy. Acad., Lit. and Phil. Soc. Manc., Asiat. Soc. Beng., Roy. Soc. Wales, Med. Chir. Soc., Roy. Agric. Soc., Pharm. Soc. Lond., Soc. Nat. Hist., Soc. Helvét. des Sci. Nat., and Acad. Imp. de Méd. St. Petersburg; Mem. Assoc. Soc. de Biol. Paris; M. K. Vetensk.-Soc. Upsala; Honorary Perpetual President of International Congress of Physiology; Professor of Physiology at the University of Cambridge. *Great Shelford, Cambridge.*
- 1891 Frankland, Percy Faraday, Ph.D., M.Sc. A.R.S.M. Professor of Chemistry in the University of Birmingham. *The University of Birmingham.*
- 1877 Fraser, Thomas Richard, M.D. (Edin.) Pres. R.C.P. & F.R.S. (Edin.) LL.D. (Aberd. and Glasg.) Professor of Materia Medica and Clinical Medicine in the University of Edinburgh. 13 Dr. *heugh Gardens, Edinburgh.*
- 1894 Froude, Robert Edmund. Superintendent of the Admiralty Experimental Works, Gosport. *North Lodge, Alverstoke, Gosport.*
- 1883 Fry, Right Hon. Sir Edward, B.A. (Lond.) D.C.L. (Oxon.) LL.D. (Edin.) F.S.A. F.L.S. Fellow of the University of London, and University College, London; and Hon. Fellow, Balliol College, Oxon. *Failand House, Failand, near Bristol.*
- 1892 Gadow, Hans Friedrich, Ph.D. (Jena) Hon. M.A. (Camb.) Strickland Curator and Lecturer on the Advanced Morphology of Vertebrates in the University of Cambridge. *Zoological Laboratory, Cambridge.*
- 1893 Gairdner, Sir William Tennant, K.C.B. M.D. (Edin.) Hon. LL.D. (Dubl.) Hon. LL.D. (Edin.) F.R.C.P. (Edin.) Hon. F.R.S. (Ireland) late Professor of Medicine in the University of Glasgow Hon. Physician in Ordinary to the King in Scotland. 32 Grosvenor *Square, Edinburgh.*

- 1860 Galton, Francis, M.A. (Cantab.) D.C.L. (Oxon.) Sc.D. (Camb.) Officier de l'Instruction Publique, France; Corresp. Memb. of the Geograph. Societies of Berlin and Vienna, and of Anthropol. Soc. of Rome; Hon. Memb. of Geograph. Soc. of Italy, and Inst. Internat. de Statistique. **Medal: Royal.** 42 Rutland Gate, S.W.
- 1899 Gamble, James Sykes, C.I.E. M.A. (Oxon.) F.L.S., late Conservator of Forests in India, and Director of the Imperial Forest School, Dehra Dun. *Highfield, East Liss, Hants.*
- 1872 Gamgee, Arthur, M.D. F.R.C.P. (Lond.) Emeritus Professor of Physiology in Owens College, Victoria University; late Fullerian Professor of Physiology in the Royal Institution. 5 Avenue du Kursaal, Montreux, Switzerland.
- 1890 Gardiner, Walter, M.A. Fellow and Bursar of Clare College, Cambridge. **Medal: Royal.** *St. Andrews, Hill's Road, Cambridge.*
- 1858 Garrod, Sir Alfred Baring, M.D. Coll. Reg. Med. Socius; Physician Extraordinary to the Queen; Consulting Physician to King's College Hospital. 10 Harley Street, W.
- 1882 Gaskell, Walter Holbrook, M.A. M.D. (Camb.) LL.D. (Edin. and Univ. McGill) Fellow of Trinity Hall and University Lecturer in Physiology, Cambridge; F.R. Med. Chir. Soc., Corr. Mem. Acad. Imp. Milit. de Méd. St. Petersburg. **Medal: Royal.** *The Uplands, Great Shelford, near Cambridge.*
- 1865 Geikie, Sir Archibald, Knt. D.C.L. (Oxon.) Sc.D. (Cantab. Dubl.) LL.D. (Edin. Glasg. St. And.) F.R.S.E. F.G.S. F.Z.S., late Director-General of the Geological Survey of the United Kingdom, and of the Museum of Practical Geology, London.; Inst. Franç. (Acad. Sci.), Accad. Reg. Lincei, Romæ, Acad. Reg. Berol., Acad. Reg. Stockholm, Acad. Imp. Sci. Vindob., Acad. Reg. Belg., Acad. Reg. Bavar. Monach. Acad. Nat. Amer., Soc.; Soc. Reg. Sci. Göttingen, Caesar. Leop. Carol. Acad. Sci. Nat., Soc. Imp. Mineral. Petropol., Soc. Imp. Nat. Sci. Mosquen, Acad. Reg. Valdarnese del Poggio, Soc. Geogr. Ital. et Batav., Soc. Geol. Edin., Glasg., Liverp., Manchestr., Franc., Belg., Stockholm, Soc. Phil. Cantab. Ebor. et Americ., Soc. Sci. Christiania, Soc. **Medal: Royal.** 10 Chester Terrace, Regent's Park, N.W.
- 1875 Geikie, James, LL.D. D.C.L. (Dunelm.) F.R.S.E. F.R.G.S. F.G.S. Murchison Professor of Geology and Mineralogy in the University of Edinburgh; Hon. Memb. Phil. Soc. York, Lit. Phil. Soc. Manch., Geol. Soc. Stockholm, Vidensk.-Selsk. Christiania, Geol. Palæont. Hydrol. Belg., Gesell. f. Erdk. Berlin, Soc. Geogr. Neuchâtel; Memb. Amer. Phil. Soc., Corresp. Memb. Acad. Sci. Philadelphia, Acad. Sci. New York. *Kilmorie, Colinton Road, Edinburgh.*
- 1892 Giffen, Sir Robert, K.C.B. LL.D. (Glasg.) 40 Brunswick Road, Hove, Brighton.

- 1883 Gill, Sir David, K.C.B. LL.D. (Aberd. and Edin.) Hon. F.R.S.E. F.R.A.S. F.R.G.S. His Majesty's Astronomer at the Cape of Good Hope; *Medjidie*, Third Order, Turkey; Trustee of the South African Museum, Corresp. Inst. Fr. (Acad. Sci.); Corresp. Mem. Acad. Imp. Sci. S. Petersb.; Akad. Wiss. Berl.; Soc. degli Spettroscop. Ital. Rome; Soc. Nat. des Sci. Nat. et Math. Cherb.; Soc. Geogr. Lisbon; For. Mem. Akad. Wetensch. Amsterd.; Nat. Acad. Sci. Washington, and Soc. Holl. des Sci. Haarlem; Hon. Mem. New York Acad. Sci. *Royal Observatory, Cape of Good Hope*; and *Athenæum Club*.
- 1853 Gladstone, John Hall, Ph.D. Sc.D. (Dubl.) F.I.C. Past Pres. C.S. Past Pres. Phys. Soc. M.I.E.E. **Medal: Davy.** 17 *Pembridge Square, W.*
- 1849 Glaisher, James, F.R.A.S. Ord. Bras. Rosae Eq. *The Shola, Heathfield Road, South Croydon.*
- 1875 Glaisher, James Whitbread Lee, Sc.D. (Camb. and Dubl.) P.R.A.S. F.C.P.S. *Trinity College, Cambridge.*
- 1882 Glazebrook, Richard Tetley, M.A. Hon. Sc.D. (Vict.) F.C.P.S. Fellow of Trinity College, Cambridge; Director of the National Physical Laboratory; late Principal of University College, Liverpool. *Bushy House, Teddington, Middlesex*; and *Athenæum Club, S.W.*
- 1882 Godman, Frederick Ducane, D.C.L. (Oxon.) F.L.S. F.G.S. F.E.S. Trustee of the British Museum. 10 *Chandos Street, Cavendish Square, W.*; and *South Lodge, Horsham.*
- 1880 Godwin-Austen, Henry Haversham, Lieut.-Col. F.Z.S. F.R.G.S. *Nore, Godalming.*
- 1865 Gore, George, LL.D. (Edin.). *Inst. Sci. Research, 20 Easy Row, Birmingham.*
- 1896 Gorst, Right Hon. Sir John Eldon, K.C. M.A. Hon. Fellow of St. John's College, Cambridge. *Queen Anne's Mansions, St. James's Park, S.W.*; and *Howes Close, Cambridge.*
- 1872 Goschen, Right Hon. George Joachim, Viscount, M.A. *Seacroft Heath, Hawkhurst, Kent..*
- 1892 Gotch, Francis, D.Sc. M.A. (Oxon.) Waynflete Professor of Physiology in the University of Oxford. *The Lawn, Banbury Road, Oxford.*
- 1887 Gowers, Sir William Richard, M.D. F.R.C.P. Fellow of University College, London; Consulting Physician to University College Hospital; Physician to the National Hospital for the Paralysed and Epileptic. 50 *Queen Anne Street, W.*
- 1881 Grant Duff, Right Hon. Sir Mountstuart Elphinstone, G.C.S.I. 11 *Chelsea Embankment*; *Lexden Park, Colchester*; and *Athenæum Club, S.W.*
- 1896 Gray, Andrew, M.A. LL.D. (Glasg.) F.R.S.E. Professor of Natural Philosophy in the University of Glasgow. 11 *The University, Glasgow.*

- 1895 Green, Joseph Reynolds, M.A. Sc.D. (Camb.) B.Sc. (Lond.) F.L.S.
Professor of Botany to the Pharmaceutical Society of Great
Britain. 61A *St. Andrew's Street, Cambridge.*
- 1888 Greenhill, Alfred George, M.A. Professor of Mathematics in the 18
Ordnance College, Woolwich; Officier d'Académie, Paris; For.
Mem. R. Accad. dei Lincei. 10 *New Inn, W.C.*
- 1878 Greenwell, Rev. William, M.A. D.C.L. Canon of Durham, F.S.A.
Durham.
- 1901 Gregory, John Walter, D.Sc. F.G.S. Professor of Geology in the
University of Melbourne. *The University, Melbourne, Victoria.*
- 1895 Griffiths, Ernest Howard, M.A. Principal and Professor of Physics,
University College of South Wales and Monmouthshire; Fellow
of Sidney Sussex College, Cambridge. *University College, Cardiff.*
- 1883 Groves, Charles Edward, F.C.S. F.I.C. 352 *Kennington Road, S.E.*
- 1883 Grubb, Sir Howard, F.R.A.S. *Rockdale, Orwell Road, Rathgar,
Dublin.*
- 1867 Günther, Albert C. L. G., M.A. M.D. Ph.D. F.L.S. F.Z.S. late 187
Keeper of the Zoological Department in the British Museum,
Soc. Reg. Scient. Upsal; Soc. Phys.-Med. ad Rhenum infer., Soc. 187
Zool.-Bot. Vindob. Socius ord.; Reg. Acad. Panormit. Scient.,
Soc. Asiat. Bengal., Instit. Nov. Zel., Soc. Linn. Nov. Gall., Soc.
Nat. Scrutat. Basil., Soc. Zool. Gall., Soc. Lit. et Phil. Liverpool,
Soc. Roman. Zoolog. Socius Honor.; Imp. Acad. Scient. Petropol.,
Reg. Acad. Scient. Taurin., Reg. Acad. Scient. Suec., Soc. Senckenb.
Nat. Scrutat. Francof. Acad. Scient. nat. Philad., Acad. Scient.
nat. Californ., Soc. Scient. nat. Cherbourg, Soc. Human. et Scient.
Gall. Merid. Orient. Socius extran. **Medal: Royal.** *Lichfield
Road, Kew Gardens, Surrey.*
- 1899 Haddon, Alfred Cort, M.A. Sc.D. M.R.I.A. University Lecturer in
Ethnology, Cambridge. *Inisfail, Hills Road, Cambridge.*
- 1897 Haldane, John Scott, M.A. M.D. M.R.C.P. (Edin.) Lecturer in
Physiology in the University of Oxford. 4 *St. Margaret's Road,
Oxford.*
- 1891 Halliburton, William Dobinson, M.D. B.Sc. F.R.C.P. Professor of 1898
Physiology in King's College, London. *Church Cottage, 17 Mary-
lebone Road, N.W.*
- 1887 Halsbury, Right Hon. Hardinge Stanley Giffard, Earl of, M.A. D.C.L.
High Steward of the University of Oxford. 4 *Ennismore Gar-
dens, W.*
- 1863 Harcourt, Augustus George Vernon, M.A. (Oxon.) D.C.L. (Dunelm.) 187
LL.D. (Univ. McGill) V.P.C.S. Lee's Reader in Chemistry at
Christ Church. *Cowley Grange, Oxford; and Athenæum
Club, S.W.*
- 1881 Harcourt, Right Hon. Sir William George Granville Venables Vernon,
Knt., M.A. Trust. Brit. Mus. *Malwood, Lyndhurst, Hants.*
- 1863 Harley, Rev. Robert, M.A. (Oxon.) F.R.A.S. Lit. et Phil. Soc. Manc.
et Soc. Reg. Queensl. Soc. Honor. *Rosslyn, Westbourne Road,
Forest Hill, S.E.; and Athenæum Club, S.W.*

- 1896-97
- 1898 Harmer, Sidney Frederic, Sc.D. Superintendent of the University Museum of Zoology, and Fellow of King's College, Cambridge. *King's College, Cambridge.*
- 1884 Hartley, Walter Noel, D.Sc. (Roy. Univ. Ireland), F.R.S.E. F.I.C. Hon. Fellow of King's College, London, Professor of Chemistry in the Royal College of Science for Ireland. *Royal College of Science, Stephen's Green, Dublin; and 36 Waterloo Road, Dublin.*
- 1897 Haswell, William, M.A. D.Sc. (Edin.) F.L.S. Corr. Mem. Roy. Soc. Tasman. ; Mem. K. Leop. Carol. Deutsche Akad. Halle ; Challis Professor of Zoology in the University of Sydney. *The University, Sydney, N.S.W.*
- 1864 Hay, Right Hon. Sir John Charles Dalrymple, Bart., Admiral, K.C.B. D.C.L. (Oxon.) F.R.G.S. V.P. Inst. Naval Architects. 108 *St. George's Square, S.W. ; and Craigenveoch, Wigtownshire, N.B.*
- 1876 Hayward, Robert Baldwin, M.A. *Ashcombe, Shanklin, Isle of Wight.*
- 1899 Head, Henry, M.A. M.D. F.R.C.P. M.R.C.S. 61 *Wimpole Street, W.*
- 1891 Heavyside, Oliver, Hon. Mem. Lit. Phil. Soc. Manchester ; Amer. Acad. Arts and Sci. *Bradley View, Newton Abbot, Devon.*
- 1866 Hector, Sir James, K.C.M.G. Ord. Cr. Pruss. M.D. F.G.S. F.L.S. F.R.S.E. C.M.Z.S. Hon. Mem. of the Royal Societies of Victoria, New South Wales, South Australia, and Tasmania ; For. Mem. Amer. Acad. Sci., Amer. Inst. Mining Engs., and K. Leop. Carol. Acad. ; Director of the Geological Survey, Colonial Laboratory, Meteorological and Weather Departments, and of the New Zealand Institute ; Chancellor of the New Zealand University. *Wellington, New Zealand.*
- 1899 Hele-Shaw, Henry Selby, LL.D. (St. Andr.) M. Inst. C.E. M. Inst. M.E. Harrison Professor of Engineering in University College, Liverpool. 27 *Ullet Road, Sefton Park, Liverpool.*
- 1889 Hemsley, William Botting, F.L.S. Hon. Memb. Nat. Hist. Soc. Mexico ; Keeper of the Herbarium, Royal Gardens, Kew. *Royal Gardens, Kew.*
- 1875 Hennessey, John Baboneau Nickterlien, C.I.E. M.A. F.R.A.S. F.R.G.S. Late Deputy Surveyor-General in charge of the Trigonometrical Surveys, Survey of India. *Merrimu, 18 Alleyn Park, West Dulwich, S.E. ; and Athenæum Club, S.W.*
- 1874 Henrici, Olaus Magnus Friedrich Erdmann, Ph.D. LL.D. (St. And.) Professor of Mechanics and Mathematics in the City and Guilds of London Institute. *Central Technical College, Exhibition Road, S.W. ; and 34 Clarendon Road, Notting Hill, W.*
- 1892 Herdman, William Abbott, D.Sc. F.R.S.E. F.L.S. Professor of Natural History in University College, Liverpool. *Croxeth Lodge, Ullet Road, Liverpool.*
- 1884 Herschel, Alexander Stewart, M.A. Hon. D.C.L. (Durham), F.R.A.S. Honorary Professor of Physics and Experimental Philosophy in the Durham College of Science, Newcastle-on-Tyne. *Observatory House, Slough, Bucks.*

- 1871 Herschel, John, Col. R.E. F.R.A.S. Late Deputy Superintendent, Great Trigonometrical Survey of India. *Observatory House, Slough, Bucks.*
- 1895 Heycock, Charles Thomas, M.A. Lecturer on Natural Science, King's College, Cambridge. *24 Fitzwilliam Street, Cambridge.*
- 1885 Hicks, William Mitchinson, M.A. D.Sc. Late Fellow of St. John's College, Cambridge; Principal and Professor of Physics in University College, Sheffield. *Dunheved, Endcliffe Crescent, Sheffield.*
- 1895 Hickson, Sydney John, D.Sc. (Lond.) M.A. (Camb.) Hon. M.A. (Oxon.) F.Z.S. Hon. Fellow of Downing College, Cambridge; Professor of Zoology in Owens College, Manchester; Hon. Mem. K. Inst. Taal-Land-en Volkenkunde Neder.-Indië. *Ellesmere House, Withington, Manchester.*
- 1900 Hill, Leonard, M.B. Lecturer on Physiology in the London Hospital Medical College. *Jasmine Cottage, Froggnal, Hampstead, N.W.*
- 1894 Hill, Micaiah J. M., M.A. D.Sc. Professor of Mathematics, University College, London. *Lakeview, Northwood, R.S.O., Middlesex.*
- 1896 Hinde, George Jennings, Ph.D. (Munich) F.G.S. *Irythorn, 24 Avondale Road, South Croydon.*
- 1893 Hobson, Ernest William, D.Sc. Fellow of Christ's College, Cambridge. *The Gables, Mount Pleasant, Cambridge.*
- 1895 Holden, Henry Capel Lofft, Lieut.-Col. R.A. *2 St. John's Park, Blackheath; and Royal Arsenal, Woolwich.*
- 1847 Hooker, Sir Joseph Dalton, G.C.S.I. C.B.—**Past President**—M.D. D.C.L. LL.D. F.L.S. F.G.S. F.R.G.S. Hon. Mem. Roy. Bot. Soc. and Roy. Med. Chir. Soc., London; Bot. and Med. Soc., Edin.; R.I.A., Dubl.; Nat. Hist. Soc. Newcastle; Camb. Philos. Soc.; Asiat. Soc. Beng.; and New Zeal. Institute. Member of Acad. Sci., Paris; Acad. Imp. Sci., St. Petersburg; K. Akad. der Wissensch., K. K. Geogr. Gesell., and Hort. Soc. of Vienna; K. Akad. der Wissensch., Berlin; Accad. delle Sci. dell' Istit. Bologna; Acad. Roy. des Sci. Brussels; Reale Accad. dei Georgofili, Florence; Kong. Dansk. Vidensk. Selsk. Copenh.; K. Gesell. der Wiss. Gött.; K. Danske Vidensk. Selskab., Stockholm; K. Vetensk. Soc., Upsala; K. Phys.-oekonom. Gesell. Königsb.; Soc. Vellosiana, Rio de Janeiro; K. Leopold.-Carol. Deut. Akad. der Naturf., Halle; Senck. Naturf. Gesell. Frankf. a M.; K. Baier. Bot. Gesell., Ratisbon; R. Accad. dei Lincei, Rome; Amer. Acad. of Sci., Boston. Corresp. Mem. of Dubl. Nat. Hist. Soc. and Agricult. Soc. of Paris. For. Mem. of Acad. de Méd., Paris, and Nat. Acad. of Sci., Washington. **Medals: Copley, Royal, Darwin.** *The Camp, Sunningdale, Berkshire.*
- 1900 Horne, John, F.R.S.E. F.G.S. *Geological Survey Office, Sheriff Court Buildings, Edinburgh; and 12 Keith Crescent, Blackhall, Midlothian.*

- 1886 Horsley, Victor Alexander Haden, B.S. F.R.C.S. M.D. (Halle), late Professor of Pathology in University College, London. **Medal: Royal.** 25 *Cavendish Square, W.*; and *Athenæum Club, S.W.*
- 1897 Howes, George Bond, LL.D. (St. Andr.) F.L.S. Vice-Pres. Z.S. Professor of Zoology in the Royal College of Science, London. *Ingledene, Barrowgate Road, Chiswick, W.*
- 1893 Howorth, Sir Henry Hoyle, K.C.I.E. D.C.L. 30 *Collingham Place, Cromwell Road, S.W.*
- 1884 Hudleston, Wilfrid H., M.A. F.G.S. F.C.S. 8 *Stanhope Gardens, South Kensington, S.W.*
- 1889 Hudson, Charles Thomas, M.A., LL.D. (Camb.). *Hillside, Clarence Road, Shanklin, Isle of Wight.*
- 1865 Huggins, Sir William, K.C.B.—**President**—D.C.L. (Oxon.) LL.D. (Cantab. Edin. Dubl. et St. And.) D.Sc. (Vict.) Ph.D. (Lugd. Bat.) Hon. F.R.S.E. F.R.A.S. Ord. Imp. Bras. Rosae; Comm. Inst. Fr. (Acad. Sci.), Acad. Reg. Sci. Berol., Soc. Reg. Sci. Gött. et Soc. Spettros. Ital. Mem. Corr.; Acad. Lync. Romæ Soc.; Acad. Sci. Reg. Boruss., Soc. Phil. Amer. Philad., Acad. Amer. Art. et Sci. Boston, Reg. Sci. Hafn., Physiogr. Lund, Reg. Boie. Marob. Acad. Reg. Sci., Acad. Reg. Hib., Soc. Reg. Dubl., Lit. Phil. Manc., Soc. Astr. de France, Soc. Astr. et Phys. Toronto, Soc. Hist. Dallas et Soc. Reg. Nov. Camb. Austr. Soc. Honor.; Russ. Ast. Soc. For. Mem. **Medals: Copley, Rumford, Royal.** 90 *Upper Tulse Hill; and Athenæum Club, S.W.*
- 1889 Hughes, Thomas McKenny, M.A. Trin. Coll. Camb. F.G.S. F.S.A. Professorial Fellow of Clare College, Camb.; Chev. Ord. SS^{ram} Maur. et Lazar. Ital.; Corresp. Memb. Soc. Géol. de Belg. and Soc. Géol. de Fr.; Woodwardian Professor of Geology in the University of Cambridge. 18 *Hills Road, Cambridge.*
- 1867 Hull, Edward, M.A. LL.D. (Glasg.) F.G.S. late Director of the Geological Survey of Ireland, and Professor of Geology in the Royal College of Science; Master in Engineering (Hon. Caus. Dubl.); Hon. Mem. Acad. Sci. Amer. Philad., Soc. Géol. Belg., Geol. Soc. Edin., Glasg., Manch. 20 *Arundel Gardens, Notting Hill, W.*
- 1882 Hutchinson, Jonathan, LL.D. (Glasg. and Camb.) M.D. (Dubl.) F.R.C.S. Corr. Mem. Soc. Chir. Paris; Hon. Mem. Soc. Dermat. Nov. Ebor. Formerly President of and Professor of Pathology and Surgery in the Royal College of Surgeons. 15 *Cavendish Square, W.*
- 1892 Hutton, Frederick Wollaston, Captain. F.G.S. C.M.Z.S. Curator of the Canterbury Museum, Christchurch; Cor. Mem. Roy. Soc. Tas.; Hon. Mem. Roy. Soc. N.S.W. Corresp. du Mus. d'Hist. Nat. Paris, Acad. Nat. Sci. Philad., Ornith. Ver. Wien, and K. K. Geol. Reichsanst. Wien. *Canterbury Museum, Christchurch, New Zealand.*

- 1901 Jackson, Henry Bradwardine, Captain R.N. Assistant Director of Torpedoes, Admiralty. *Admiralty, Whitehall, S.W.*
- 1878 Jackson, John Hughlings, M.D. Coll. Reg. Med. Soc., Consulting Physician to the London Hospital. *3 Manchester Square, W.*
- 1891 Jackson, Right Hon. William Lawies. *27 Cadogan Square, S.W.; and Allerton Hall, Chapel Allerton, Leeds.*
- 1885 Japp, Francis Robert, M.A. LL.D. (St. And.) F.I.C. F.C.S. Professor of Chemistry in the University of Aberdeen. *University, Aberdeen.*
- 1894 Jervis-Smith, Rev. Frederick John, M.A. (Oxon.) University Lecturer in Mechanics, and Millard Lecturer in Experimental Mechanics, Trinity College, Oxford. *Millard Laboratory, 3 St. Giles, Oxford.*
- 1892 Joly, John, M.A. B.E. D.Sc. Professor of Geology and Mineralogy in the University of Dublin. *12 Northbrook Road, Leeson Park, Dublin.*
- 1872 Jones, Thomas Rupert, F.G.S. Hon. Mem. Gesell. Isis, Dresden, Soc. Belg. de Microsc., Soc. Géol. Hydrol. Palæontol. Brux., Geol. Assoc. Lond., Geol. Soc. Glasg., Roy. Irish Geol. Soc., and Anthropol. Inst. Lond.; Corresp. of the K.-K. Geolog. Reichsanst. Wien, Acad. Nat. Sci. Philad., and Geol. Soc. Edin. *17 Parson's Green, Fulham, S.W.*
- 1877 Judd, John Wesley, C.B. LL.D. F.G.S. Professor of Geology in the Royal College of Science, London, and Dean of the College; Soc. Phil. Ebor., Sci. Nat. Deva., Soc. Reg. Sydney, Soc. Asiat. Beng., Soc. Géol. du Nord, France, Soc. Belg. de Géol. de Pal. et d'Hydrol., Soc. Honor.; Acad. Sci. Nat. Philad., Soc. Géol. Belg. Brux., Inst. Imp. Geol. Vindob. Corresp. *22 Cumberland Road, Kew; Royal College of Science, South Kensington; and Athenæum Club, S.W.*
- 1851 Kelvin, William Thomson, Lord—**Past President**—G.C.V.O. D.C.L. (Oxon.) LL.D. (Camb. Dubl. Edin. Glasg. Princeton, Toronto) F.R.S.E. Hon. Mem. Inst. C.E., and Elect. Eng. late Professor of Natural Philosophy in the University of Glasgow, and Fellow of St. Peter's College, Cambridge; Grand Officer of the Legion of Honour of France. Ord. of First Class of the Sacred Treasure of Japan; Knt. Pruss. Ord. "*Pour le Mérite*"; Comm. Ord. of Leopold, Belgium; Comm. Imp. Ord. of the Rose, Brazil; Assoc. Étrang. Inst. Fr. (Acad. Sci.) Paris; Corresp. Mem. R. Ist. Lomb. Milan, R. Accad. dei Lincei, Rome; For. Mem. Königl. Preuss. Akad. Berl., Königl. Gesell. Wiss. Gött., Soc. Ital. di Scienze, Milan, Soc. Reale di Napoli, Kongl. Svenska Vetenskaps-Akad. Stockholm, Acad. Nat. Sci. Philad.; Hon. Mem. Acad. Imp. Sci. Vienna, Acad. Nov. Lynce. Rom., United Service Inst. Lond., Lit. and Phil. Soc. Manch., Phil. Soc. Glasg., Roy. Irish Acad., Asiat. Soc. Bengal. **Medals: Copley, Royal.** *Netherhall, Largs, Ayrshire; 15 Eaton Place, S.W., and Athenæum Club, S.W.*

- 1881 Kempe, Alfred Bray, M.A.—**Treasurer and Vice President**—
2 *Paper Buildings, Temple, E.C.*; and 10 *Porchester Square, Hyde Park, W.*
- 1887 Kennedy, Alexander B. W., LL.D. Mem. Inst. C.E. Past Pres. Inst. M.E., Emeritus Professor of Engineering and Mechanical Technology in University College, London. 1 *Queen Anne Street, Cavendish Square, W.*
- 1890 Kerr, Rev. John, LL.D. Mathematical Lecturer in the Free Church Training College, Glasgow. **Medal: Royal.** 113 *Hill Street, Glasgow.*
- 1887 King, Sir George, K.C.I.E. M.B. LL.D. F.L.S. Late Director of the Botanical Survey of India, Superintendent of the Royal Botanical Gardens, Calcutta, and of the Government Cinchona Plantations, Darjeeling. *Athenæum Club*; and c/o Messrs. Grindlay and Co., 54 *Parliament Street, S.W.*
- Kingsburgh (see Macdonald, J. H. A.).
- 1897 Kipping, F. Stanley, D.Sc. (Lond.) Ph.D. (Munich). Professor of Chemistry University College, Nottingham. *University College, Nottingham.*
- 1887 Kirk, Sir John, G.C.M.G. K.C.B. M.D. LL.D. D.C.L. (Oxon.) D.Sc. (Camb.) F.L.S. F.R.G.S. *Wavertree, Sevenoaks, Kent*; and *Athenæum Club, S.W.*
- 1875 Klein, Edward Emanuel, M.D. Lecturer on General Anatomy and Physiology in the Medical School, St. Bartholomew's Hospital. *Harewood, Riverdale Gardens, Twickenham Park, Richmond.*
- 1884 Lamb, Horace, M.A. (Cantab.) LL.D. (Glasg.) Professor of Mathematics in the Owens College, Manchester. 6 *Wilbraham Road, Fallowfield, Manchester.*
- 1883 Langley, John Newport, M.A. D.Sc. Fellow and Lecturer of Trinity College. Deputy Professor of Physiology, and Lecturer on Histology in the University of Cambridge; Corr. Mem. Soc. de Biol., Paris, and Royal Military Acad., St. Petersburg. **Medal: Royal.** *Trinity College, Cambridge*; and *Athenæum Club, S.W.*
- 1875 Lankester, Edwin Ray, M.A. (Oxon.) LL.D. (St. And.) Director of the Natural History Departments, British Museum; late Fullerian Professor of Physiology in the Royal Institution; Honorary Fellow of Exeter College, Oxford; Corr. Inst. Fr. (Acad. Sci.); Hon. Mem. Camb. Phil. Soc., Roy. Phys. Soc. Edin., Soc. de Biol. Paris, and New York Acad. Sci.; Corr. Mem. Acad. Imp. Sci. St. Petersburg; Corr. Acad. Nat. Sci. Philadelphia; For. Mem. R. Accad. dei Lincei; Böhm. Gesell. Wiss.; Assoc. Roy. Acad. Belg.; Corr. Mem. Roy. Soc. Sci. Gött. **Medal: Royal.** *British Museum (Natural History), Cromwell Road, S.W.*; and *Athenæum Club, S.W.*
- 1888 Lapworth, Charles, LL.D. (Aberd.), Pres. G.S. Professor of Geology in the University of Birmingham. **Medal: Royal.** 48 *Frederick Road, Edgbaston, Birmingham.*

- 1892 Larmor, Joseph—**Secretary**—M.A. D.Sc. (Lond.) LL.D. (Glasg.) 18
F.R.A.S. Fellow of St. John's College, Cambridge; Past. Pres. 19
Camb. Phil. Soc.; formerly Professor of Natural Philosophy in
Queen's College, Galway, and Fellow of the Royal University of 19
Ireland. *St. John's College, Cambridge.*
- 1890 Lea, Arthur Sheridan, M.A. Sc.D. Fellow, and formerly Lecturer in
Physiology, and Tutor of Gonville and Caius College, sometime
Assistant Lecturer of Trinity College, and University Lecturer,
Cambridge. *Sunnyside, Sidcup, Kent.*
- 1899 Lefevre, Right Hon. George John Shaw, M.A. 18 *Bryanston*
Square, W., and Abbotsworthy House, Kingsworthy, Winchester.
- 1898 Lindley, Right Hon. Nathaniel, Lord. 19 *Craven Hill Gardens, W.,*
Athenæum Club, S.W.; and The Lodge, East Carlton,
Norwich.
- 1898 Lister, Arthur, F.L.S. *Leytonstone, Essex.*
- 1860 Lister, Joseph, Lord—**Past President**—B.A. and M.B. (Lond.) 18
F.R.C.S. D.C.L. (Oxon.) Hon. M.D. (Dubl. Würzburg, Bologna, 18
Buda Pest, Vienna) LL.D. (Camb. Edin. Glasg. Toronto and **For**
Univ. McGill) D.Sc. (Vict.) Emeritus Professor of Clinical 18
Surgery, King's College, London, Serjeant-Surgeon in Ordinary to
the King. Knt. Comm. 1st Class, Ord. Danebrog; Knt. Pruss. 189
Ord. "Pour le Mérite"; Assoc. Étrang. Inst. Fr. (Acad. Sci.);
Hon. Mem. R.I.A.; Hon. Mem. Asiat. Soc. Bengal, Amer. Acad.
Arts and Sci., and Acad. Imp. Milit de Méd., St. Petersburg.
Medal: Royal. 12 *Park Crescent, Portland Place, W.*
- 1900 Lister, Joseph Jackson, M.A. F.Z.S. *St. John's College, Cambridge.*
- 1879 Liveing, George Downing, M.A. Sc.D. (Dubl.) Professor of Chemistry 18
in the University of Cambridge; Fellow of St. John's College,
Cambridge. **Medal: Davy.** *Newnham, Cambridge.* 18
- 1882 Liversidge, Archibald, M.A. (Camb.) LL.D. (Glasg.) Assoc. B.S.M.;
Hon. F.R.S.E. F.C.S. F.I.C. F.G.S. F.R.G.S. Memb. Phil. Soc.
Camb., Phys. Soc. Lond., Min. Soc. Gr. Brit., Min. Soc. Fr.; Hon.
Mem. Roy. Soc. Vict., New Zeal. Inst., Roy. Histor. Soc., K. Leop.
Carol. Acad. Halle; Corr. Mem. New York Acad. Sci., Senck.
Naturf. Gesell. Frankf., Roy. Soc. Tasm., Roy. Soc. Queensland,
Soc. d'Acclimat. Maur., Edin. Geol. Soc. Professor of Chemistry
in the University of Sydney. *St. Mark's Road, Darling Point,*
Sydney, New South Wales.
- 1869 Lockyer, Sir J. Norman, K.C.B. Memb. Phys. Soc. Lond., Ord. Imp.
Bras. Rosae. Eq. Inst. Fr. (Acad. Sci.), Soc. pro fov. Indust. Nat.
Par., Soc. Reg. Sci. Gött., Frank. Inst. Philad., Soc. Phys., Soc.
Reg. Med. Brux., Soc. Spettros. Ital., Reg. Sci. Panorm. et Hist.
Nat. Genev. Mem. Corr.; Acad. Reg. Linc. Romæ. et Soc. Phil.
Amer. Philad. Socius.; Soc. Lit. et Phil. Manc., Acad. Gioen.
Sci. Nat. Catan., Soc. Phil. Ebor. et Univ. Lehigh Soc. Honor.
Medal: Rumford. 16 *Penywen Road, S.W.; and Solar*
Physics Observatory, South Kensington, S.W.

- 1887 Hough, Augustus Edward D.Sc. (Oxon. Lond.) LL.D. (Glasg. St. And.)
M. Inst. E.E. Principal of the University of Birmingham;
Corr. Mem. Amer. Phil. Soc. Philad., Accad. Sci. dell' Istituto.
Bologna, Bataafsche Genoots., Rotterdam. **Medal: Rumford.**
The University, Birmingham.
- 1894 Love, Augustus Edward Hough, M.A. D.Sc. Sedleian Professor of
Natural Philosophy in the University of Oxford. 34 *St. Mar-*
garet's Road, Oxford.
- 1894 Lydekker, Richard, B.A. (Camb.). *The Lodge, Harpenden, Herts.*
- 1881 Macalister, Alexander, M.A. M.D. (Dubl. & Camb.) Sc.D. (Dubl.)
LL.D. (Glasg. and Univ. McGill) Professor of Anatomy in the
University of Cambridge. *Torrisdale, Cambridge.*
- 1895 McClean, Frank, M.A., LL.D. (Glasg.) F.R.A.S., M. Inst. C.E.
Athenæum Club, S.W.; and Rushall House, Tunbridge Wells.
- 1865 McClintock, Sir Francis Leopold, Admiral, K.C.B. D.C.L. LL.D.
16 *Queensberry Place, Cromwell Road, S.W.*
- 1901 Macdonald, Hector Munro, M.A. Fellow of Clare College, Cambridge,
bridge.
and University Lecturer in Mathematics. *Clare College, Cam-*
- 1859 Macdonald, John Denis M.D. Inspector-General of Hospitals and
Fleets R.N. *Amwell Place, Hassocks, Sussex.*
- 1888 Macdonald, Right Hon. Sir John Hay Athole, K.C.B. LL.D. F.R.S.E.
M.I.E.E. Lord Justice-Clerk of Scotland, and Lord President of
the Second Division of the Court of Session. 15 *Abercromby*
Place, Edinburgh.
- 1895 Macewen, William, M.D. (Glasg.) Hon. LL.D. (Glasg.) Hon. F.R.C.S.
Professor of Surgery in the University of Glasgow. 3 *Woodside*
Crescent, Glasgow.
- 1900 MacGregor, James Gordon, D.Sc. (Lond.) LL.D. (Glasg. and Dalh.)
Professor of Natural Philosophy in the University of Edinburgh.
The University, Edinburgh.
- 1877 McIntosh, William Carmichael, M.D. (Edin.) LL.D. (St. And.) F.L.S.
F.R.S.E. L.R.C.S.E. C.M.Z.S. Professor of Natural History in the
University of St. Andrews; Director of the University Museum,
and of the Gatty Marine Laboratory, St. Andrews; V.P. Lit. and
Antiq. Soc. Perth; Hon. Mem. Roy. Zool. Soc. Ireland, and Nat.
Hist. Soc. Glasgow; Hon. Fell. Scot. Nat. Hist. Soc.; Hon. Mem.
Psychol. Soc. Paris, and Soc. Centrale d'Aquicult. de France.
Medal: Royal. 2 *Abbotsford Crescent, St. Andrews, Scotland;*
and Nevay Park, Meikle, Perthshire.
- 1884 McKendrick, John Gray, M.D. LL.D. F.R.S.E. F.R.C.P.E. Professor
of Physiology in the University of Glasgow. *University, Glasgow.*
- 1877 McLachlan, Robert, F.L.S. F.Z.S. F.E.S. Soc. Imp. Ami. Sci. Nat.
Mosq., Inst. Nov. Zel., Soc. pro Faun. et Flo. Fenn., Soc. Entom.
Batav., Soc. Entom. Belg., Soc. Entom. Helvet., Soc. Nat. Hist.
Glasg. Soc. Honor.; Soc. Reg. Sci. Leodium, Soc. Nat. Hist.
Bost. Corresp. *Westview, 23 Clarendon Road, Lewisham, S.E.*

- 1881 McLeod, Herbert, F.I.C. V.P.C.S. Late Professor of Chemistry in the Royal Indian Engineering College, Cooper's Hill. 9 Coverdale, Richmond, Surrey. 188
- 1898 McMahon, Charles Alexander, Lieut.-General, F.G.S. 20 Nevern Square, South Kensington, S.W.
- 1890 MacMahon, Percy Alexander, Major, R.A. (retired) D.Sc. (Dubl.) F.R.A.S. Hon. Mem. C.P.S. Medal: Royal. Queen Anne's Mansions, Westminster, S.W. 189
- 1877 Mallet, John William, Ph.D. (Gött.) M.D. LL.D. F.C.S. Mem. of the Chem. Socs. of Paris, Berlin, and New York, and of the Amer. Phil. Soc. Philad.; Assoc. Fellow of the Amer. Acad. of Arts and Sciences, Boston; Fellow of the Coll. Phys. Philad. and Hon. Fellow of the Med. Chir. Faculty of Maryland. University of Virginia, Albemarle Co., Virginia, United States.
- 1901 Mansergh, James, Past Pres. Inst. C.E. 51 Fitzjohn's Avenue, N.W.
- 1900 Manson, Patrick, C.M.G. M.D. (Aberd.) LL.D. (Aberd.) F.R.C.P. Physician and Medical Adviser to the Colonial Office; Lecturer on Tropical Medicine to St. George's Hospital, Charing Cross Hospital, and London School of Tropical Medicine. 21 Queen Anne Street, Cavendish Square, W.
- 1873 Markham, Sir Clements Robert, K.C.B. P.R.G.S. F.S.A. Acad. Caes. Nat. Cur. Socius; Soc. Geog. Par., Berol., Vindob., Hist. Philad. et Univ. Chil. Soc. Honor. Athenæum Club; and 21 Eccleston Square, S.W.
- 1891 Marr, John Edward, M.A. F.G.S. Fellow and Lecturer of St. John's College, Cambridge, and University Lecturer in Geology. St. John's College, Cambridge.
- 1901 Martin, Charles James, M.B. D.Sc. (Lond.) Professor of Physiology in the University of Melbourne. The University, Melbourne, Victoria.
- 1895 Martin, Sidney, M.D. B.S. B.Sc. F.R.C.P. Physician to University College Hospital; Professor of Pathology, University College, London. 10 Mansfield Street, Cavendish Square, W.
- 1870 Maskelyne, Nevil Story, M.A. F.G.S. Late Professor of Mineralogy in the University of Oxford; Hon. Fellow Wadham Coll. Oxon; Soc. Reg. Geol. Cornub., Soc. Imp. Min. Petrop. et Soc. Hist. Nat. Bost. Soc.; Acad. Reg. Bavar. Monach. Soc. Cor. Basset Down House, Swindon. 18
- 1870 Masters, Maxwell Tylden, M.D. M.R.C.S. F.L.S. Ord. Leopold Officier; Inst. Fr. (Acad. Sci.), Acad. Sci. Nat. Philad., Soc. Reg. Liège et Soc. Sci. Nat. Cherbourg Soc. Corr. Mount Avenue, Ealing, W.
- 1897 Mathews, George Ballard, M.A. Fellow of University College, London. Late Professor of Mathematics in the University College of North Wales. St. John's College, Cambridge.
- 1879 Matthey, George, F.C.S. Assoc. Inst. C.E. Leg. Honor. (France), Ord. Franz Josef (Austria), Great Gold Medal for Arts and Science (Germany). Cheyne House, Chelsea Embankment, S.W.
- 1898 Maxwell, Right Hon. Sir Herbert Eustace, Bart. LL.D. F.S.A. Pres. Soc. Scott. Antiq. 49 Lennox Gardens, S.W.; and Monreith, Whaaphill, Wigtownshire, N.B. 18

(1876-87) of the Geol. Survey of India. 43 *St. John's Road, Clifton, Bristol.*

- 1886 Meldola, Raphael, For. Sec. C.S. F.I.C. F.R.A.S. F.E.S. Professor of Chemistry in the Finsbury Technical College, City and Guilds of London Institute. 6 *Brunswick Square, W.C.*
- 1892 Miall, Louis Compton, J.L.D., Professor of Biology in the Yorkshire College, Leeds. 8 *Spring Road, Headingley, Leeds.*
- 1896 Miers, Henry Alexander, D.Sc. M.A. (Oxon.) F.G.S. V.P.C.S. V.P. Min. Soc. Waynflete Professor of Mineralogy in the University of Oxford. *Magdalen College, Oxford.*
- 1874 Mills, Edmund James, Hon. LL.D. (Glasg.) D.Sc. Lond. F.C.S. F.I.C. Corr. Mem. Roy. Phil. Soc. Glasg. Emeritus Professor of Technical Chemistry in the Glasgow and West of Scotland Technical College, Glasgow. 11 *Greenhill Road, Harrow.*
- 1887 Milne, John, F.G.S. Assoc. and Hon. Fellow of King's College, London. Late Professor of Mining and Geology in the Imperial College of Engineering, Japan. *Shide Hill House, Shide, Newport, Isle of Wight.*
- 1895 Minchin, George M., M.A. (Dubl.). Professor of Mathematics in the Royal Indian Engineering College, Cooper's Hill. *The College, Cooper's Hill, Staines.*
- 1871 Moncrieff, Sir Alexander, Colonel (late R.A.), K.C.B. *Bandirran, Perthshire, N.B.*; 15 *Vicarage Gate, Kensington, W.*; and *Athenæum Club, S.W.*
- 1891 Mond, Ludwig, Ph.D. F.I.C. F.C.S. *The Poplars, 20 Avenue Road, Regent's Park, N.W.*; *Athenæum Club, S.W.*; and *Winnington Hall, Northwich.*
- 1899 Morgan, Conwy Lloyd, A.R.S.M. F.G.S. Principal and Professor of Psychology in University College, Bristol. Corr. Acad. Sci. New York and Philad. 16 *Canynges Road, Clifton, Bristol.*
- 1892 Morley, Right Hon. John, M.A. D.C.L. (Oxon.) Hon. LL.D. (Camb. and Glasg.) Trust. Brit. Mus. 95 *Elm Park Gardens*; and *Athenæum Club, S.W.*
- 1896 Mott, Frederick Walker, M.D. (Lond.) F.R.C.P. *Pathological Laboratory, Claybury Asylum, Essex*; and 25 *Nottingham Place, W.*
- 1880 Moulton, John Fletcher, M.A. K.C. 57 *Onslow Square, S.W.*
- 1900 Muir, Thomas, C.M.G. M.A. LL.D. F.R.S.E. Superintendent-General of Education in Cape Colony. *Department of Public Education, Cape Town, South Africa.*
- 1866 Müller, Hugo, Ph.D. LL.D. (St. And.) V.P.C.S. Ord. SS^{rum} Lazar. et Maurit. Eq. 13 *Park Square East, N.W.*; *Crosby Hill, Camberley, Surrey*; and *Athenæum Club, S.W.*
- 1897 Murray, George Robert Milne, F.L.S. F.R.S.E. Corr. Mem. New York Acad. Sci., Keeper of the Botanical Department, British Museum. *Natural History Museum, Cromwell Road, S.W.*; and *Willow House, The Green, Ealing, W.*

- 1896 Murray, Sir John, K.C.B. Knt. Pruss. Ord. "*Pour le Mérite*"; LL.D. (Edin. and Toronto); Sc.D. (Camb.); Ph.D. (Jena); F.L.S. F.R.G.S. F.R.S.E. P.R.S.G.S. P.S.N.H.S. F.R.P.S.E. F.S. Micros. S. F.S. Met. S. F.S.A. Scot.; Hon. Memb. Geo. für Erdk. Berlin, Ges. Naturf. Freunde Berlin, Schweiz. Naturf. Ges., Senckenburg Naturf. Ges., Nat. Geogr. Soc. Washington, Lit. and Phil. Soc. Manch., Konink. Nederl. Aardrijkskundig. Genoots. Amsterdam, Nederl. Dierkundige Vereenig., Imp. Soc. Students of Nat. Hist. Anthropol. and Ethnol. Moscow, Soc. Zool. France, Geol. Soc. Edin., Nat. Hist. Soc. Glasgow, Geogr. Ges. Bern. Soc., Geogr. Ital. Rome; Corresp. Memb. Boston Soc. Nat. Hist., Russ. Imp. Acad. Sci., Russ. Imp. Soc. Geogr., Zool. Soc. London; For. Corresp. Memb. Soc. Géog. Paris; For. Hon. Memb. Amer. Acad. Arts and Sciences; Assoc. Acad. Roy. Sci. Lettres et Beaux-Arts, Belgique. **Medal: Royal.** *Challenger Lodge, Wardie, Edinburgh.*
- 1875 Nares, Sir George Strong, K.C.B. Vice-Admiral, 11 *Claremont Road, Surbiton.*
- 1897 Neville, Francis Henry, M.A. Fellow and Lecturer in Natural Science, Sidney College. *Sidney College, Cambridge; and 15 Parkside, Cambridge.*
- 1870 Newton, Alfred, M.A. F.L.S. F.Z.S. VP. Marine Biol. Assoc. Professor of Zoology and Comparative Anatomy in the University of Cambridge. **Medal: Royal.** *Magdalene College, Cambridge.*
- 1893 Newton, Edwin Tully, F.G.S. F.Z.S. Hon. Mem. Norfolk Nat. Soc. *Geological Museum, Jermyn Street, S.W.*
- 1880 Niven, Charles, M.A. LL.D. Professor of Natural Philosophy in the University, Aberdeen. 6 *Chanonry, Old Aberdeen.*
- 1882 Niven, William Davidson, C.B. M.A. LL.D. Director of Studies in the Royal Naval College, Greenwich. *Greenwich, S.E.*
- 1870 Noble, Sir Andrew, Capt., K.C.B. D.C.L. (Dunelm.) F.R.A.S. F.C.S. Ord. Medjidie, Turkey, Grand Cordon, Ord. Coron. Ital. et Ord. Jes. Christ Portug. Ord. Imp. Bras. Rosae, Gr. Off. Ord. Thesau. Sacr. Japonia, Ord. Draco d. Sinen., Com. et. Ord. Car. III. Hisp. Eq. **Medal: Royal.** *Jesmond Dene House, Newcastle-upon-Tyne; and Athenæum Club, S.W.*
- 1890 Norman, Rev. Alfred Merle, M.A. D.C.L. Hon. LL.D. (St. And.) F.L.S. Hon. Canon of Durham. *The Red House, Berkhamsted, Herts.*
- 1900 North, Right Hon. Sir Ford. 76 *Queensborough Terrace, Hyde Park, W.; and Athenæum Club, S.W.*
- 1880 Northbrook, Thomas George Baring, Earl of, LL.D. D.C.L. G.C.S.I. 4 *Hamilton Place, W.; and Stratton, Micheldever Station, Hants.*
- 1900 Northumberland, Henry George Percy, Duke of, K.G. F.S.A. President of the Royal Institution. 2 *Grosvenor Place, S.W.*

- V.P.C.S. Hon. Math. Phys. Doct. (Lugd. Bat.) Waynflete Professor of Chemistry in the University of Oxford. *Museum*; and 15 *Norham Gardens, Oxford*.
- 1863 Oliver, Daniel, LL.D. (Aberd.) F.L.S. Late Keeper of the Herbarium and Library, Royal Gardens, Kew; Emeritus Professor of Botany, University College, London. **Medal: Royal.** 10 *Kew Gardens Road, Kew*.
- 1868 Ommanney, Sir Erasmus, Admiral, Knt., C.B. LL.D. (Univ. McGill) F.R.A.S. F.R.G.S. Cross of Grand Comm. of Royal Ord. of the Saviour, Greece. 29 *Connaught Square, Hyde Park, W.*; and *United Service Club*.
- 1855 Osler, Abraham Follett. *South Bank, Edgbaston, Birmingham*.
- 1898 Osler, William, M.D. F.R.C.P. Professor of Medicine in the Johns Hopkins University, and Physician-in-Chief to the Johns Hopkins Hospital, Baltimore. 1 *West Franklin Street, Baltimore, Md., U.S.A.*
- 1895 O'Sullivan, Cornelius, F.I.C. F.C.S. 148 *High Street, Burton-on-Trent*.
- 1882 Palgrave, Robert Harry Inglis, F.S.S. *Belton near Great Yarmouth*.
- 1898 Parsons, The Hon. Charles Algernon, M.A. M.Inst.C.E. *Holeyn Hall, Wylam-on-Tyne*.
- 1863 Pavy, Frederick William, M.D. (Lond.) LL.D. (Glasg.) Coll. Reg. Med. Socius. Consulting Physician and formerly Lecturer on Physiology and Comparative Anatomy and Zoology, and on Medicine, at Guy's Hospital. 35 *Grosvenor Street, W.*
- 1892 Peach, Benjamin Neeve, F.R.S.E. F.G.S. *Geological Survey Office, Sheriff Court Buildings, Edinburgh*.
- 1896 Pearson, Karl, M.A. LL.B. Professor of Applied Mathematics and Mechanics in University College, London. **Medal: Darwin.** 7 *Well Road, Hampstead, N.W.*
- 1892 Pedler, Alexander, C.I.E. F.C.S. F.I.C. Fellow of the University of Calcutta; Director of Public Instruction with the Government of Bengal. 31-2 *Judge's Court Road, Alipur, Calcutta*.
- 1894 Penrose, Francis Cranmer, M.A. Litt.D. (Camb.) D.C.L. (Oxon.) F.R.A.S. F.S.A. Honorary Fellow of Magdalene College, Cambridge. Past. Pres. R.I.B.A.; Antiquary to the Royal Academy; Corr. Mem. Soc. Centrale Arch. Français; U.S.A. Inst. Arch.; Archæolog. Soc. Berlin and Athens; Knight of the Order of the Saviour, Greece. *Colebyfield, Copse Hill, Wimbledon, S.W.*
- 1866 Perkin, William Henry, V.P.C.S. LL.D. (St. And.) Ph.D. **Medals: 18**
Davy, Royal. *The Chestnuts, Sudbury, Harrow.*
- 1890 Perkin, William Henry, junior, Ph.D. F.I.C. F.C.S. Professor of Organic Chemistry in Owens College, Manchester. *Fairview, Wilbraham Road, Fallowfield, Manchester.*

- 1885 Perry, John, D.Sc. LL.D. Professor of Mechanics and Mathematics in the Royal College of Science, London. *Royal College of Science, South Kensington, S.W.*
- 1868 Pettigrew, James Bell, M.D. and F.R.C.P. (Edin.) LL.D. (Glasg.) Chandos. Professor of Medicine and Anatomy, and late Dean of the Medical Faculty in the University of St. Andrews; Laureate Inst. Fr. *The Swallowgate, St. Andrews, N.B.*
- 1887 Pickard-Cambridge, Rev. Octavius, M.A. *Bloxworth, Wareham, Dorset.*
- 1890 Pickering, Spencer Percival Umfreville, M.A. F.C.S. F.I.C. Mem. Phys. Soc. Lond. *Harpenden, Herts; Woolacombe, N. Devon; and 60 Palace Court, W.* ♦
- 1889 Pirbright, Right Hon. Henry de Worms, Baron. 42 *Grosvenor Place, S.W.; Henley Park, Guildford.*
- 1889 Poulton, Edward Bagnall, M.A. D.Sc. (Oxon.) Hon. LL.D. (Princeton) F.L.S. F.Z.S. F.G.S. Fellow of Jesus College, and Hope Professor of Zoology in the University of Oxford. Corresp. Mem. Acad. Sci. New York, and Soc. Nat. Hist. Boston. *Wykeham House, Banbury Road, Oxford; and St. Helen's Cottage, St. Helen's, Isle of Wight.*
- 1895 Power, William Henry, Medical Officer to H.M. Local Government Board. *Glenbrook, Greenhithe; and Local Government Board, Whitehall, S.W.*
- 1888 Poynting, John Henry, D.Sc. Professor of Physics in the University of Birmingham. 10 *Ampton Road, Edgbaston, Birmingham.*
- 1881 Preece, Sir William Henry, K.C.B. Fellow of King's College, London; 1 Past. Pres. Inst. Electr. Eng.; Past Pres. Inst. C.E.; Hon. Mem. Inst. E.E. (America); Officier Lég. Hon. France. *Gothic Lodge, Wimbledon; Penrhos, Carnarvon; and Athenæum Club, S.W.*
- 1895 Purdie, Thomas, B.Sc. Ph.D. Hon. LL.D. (Aberd.) A.R.S.M. Professor of Chemistry in the University of St. Andrews. *The University, St. Andrews.*
- 1886 Pye-Smith, Philip Henry, M.D. B.A. F.R.C.P. Consulting Physician to Guy's Hospital; Fellow of the University of London. 48 *Brook Street, W.; and Athenæum Club.*
- 1900 Rambaut, Arthur Alcock, M.A. (Dubl. et Oxon.) Sc.D. (Dubl.) F.R.A.S. Radcliffe Observer. *Radcliffe Observatory, Oxford.*
- 1888 Ramsay, William, Ph.D. (Tüb.) Ph.D. (Cracow) LL.D. (Glasg.) Sc.D. (Dubl.) F.C.S. F.I.C. Professor of Chemistry in University College, London; Officier of the Legion of Honour of France; Corresp. Inst. Fr. (Acad. Sci.), R. Istit. Veneto, For. Mem. Acad. der Wiss. Berlin, Soc. Holl. des Sci., Acad. Imp. Bohemia, R. Accad. d. Sci. Turin, Genootschap v. Phys. Rotterdam; Hon. Mem. Roy. Irish Acad. Amer. Phil. Soc., New York Acad. Sci., Lit. Phil. Soc., Manch., Pharmaceut. Soc., Soc. de Phys. et de Sci. Nat. Genève, K. Svenska Vetensk. Akad., Kong. Danske

- Frankfort-on-Main, Acad. Roy. Roumania, Amer. Chem. Soc.
Medal: Davy. 12 *Arundel Gardens, Notting Hill, W.*
- 1870 Ransom, William Henry, M.D. Coll. Reg. Med. Soc. Consulting Physician to the General Hospital, Nottingham. *The Pavement, Nottingham.*
- 1884 Ransome, Arthur, M.A. M.D. F.R.C.P. Late Professor of Public Health in Owens College, and Examiner in Sanitary Science in Cambridge and Victoria Universities. Hon. Fell. of Caius Coll., Cambridge. *Sunnyhurst, Dean Park, Bournemouth.*
- 1873 Rayleigh, John William Strutt, Lord, M.A. D.C.L. (Oxon.) Sc.D. (Camb. and Dubl.) LL.D. (Edin. Glasg. Toronto, and Univ. McGill) Ph.D. (Heidel.) Hon. Fellow of Trinity College, Cambridge; Officer of the Legion of Honour of France; Hon. Mem. Inst. C.E. F.R.A.S.; Soc. Reg. Edin., Acad. Reg. Hib., Soc. Lit. et Phil. Manc., Acad. Reg. Sci. Monach., Soc. Asiat. Beng., Soc. Honor.; Inst. Fr. (Acad. Sci.) Par. Corresp.; Acad. Reg. Sci. Hafn., Soc. Reg. Sci. Gött., Acad. Sci. Berol., Acad. Imp. Sci. Petropol. Corr. Soc.; Scientific Adviser to the Trinity House; Professor of Natural Philosophy in the Royal Institution.
Medals: Copley, Royal. *Terling Place, Witham, Essex.*
- 1876 Reed, Sir Edward James, K.C.B. *Broadway Chambers, Westminster, S.W.*
- 1899 Reid, Clement, F.G.S. F.L.S. Geological Museum, 28 *Jermyn Street, S.W.*
- 1898 Reid, Edward Waymouth, B.A. M.B. (Camb.) Professor of Physiology in University College, Dundee; St. Andrews University. *University College, Dundee.*
- 1883 Reinold, Arnold William, M.A. Professor of Physics in the Royal Naval College, Greenwich. 9 *Vanbrugh Park Road, Blackheath, S.E.*
- 1880 Reynolds, J. Emerson—**Vice-President**—M.D. Sc.D. (Dubl.) Pres. C.S. Professor of Chemistry, University of Dublin. *Burleigh House, Burlington Road, Dublin.*
- 1877 Reynolds, Osborne, M.A. (Cantab.) LL.D. (Glasg.), Mem. Inst. C.E. Hon. Fellow Queen's Coll. Camb.; Professor of Engineering in Owens College, Victoria University, Manchester. **Medal: Royal.** 19 *Lady Barn Road, Fallowfield, Manchester.*
- 1842 Riddell, Charles James Buchanan, Major-Gen. C.B. *Oaklands, Chudleigh, Devonshire.*
- 1885 Ringer, Sydney, M.D. (Lond.) 15 *Cavendish Place, W.*
- 1860 Ripon, George Frederick Samuel Robinson, Marquis of, K.G. G.C.S.I. C.I.E. D.C.L. (Oxon.) F.L.S. F.R.G.S. 9 *Chelsea Embankment, S.W.; and Studley Royal Ripon, Yorkshire.*
- 1890 Roberts, Isaac, Sc.D. (Dubl.) F.R.A.S. F.G.S. *Starfield, Crowborough, Sussex.*
- 1878 Roberts, Samuel, M.A. (Lond.) 27 *Nassington Road, Hampstead, N.W.*

- 1875 Roberts-Austen, Sir William Chandler, K.C.B. D.C.L. D.Sc. Pro-
fessor of Metallurgy, Royal College of Science; Chemist of the
Royal Mint; Chev. Lég. Hon. France; Mem. Chem. Soc. Berlin.
*Royal Mint, Tower Hill, E.; Chilworth, Guildford; and
Athenæum Club, S.W.*
- 1899 Romer, Right Hon. Sir Robert, G.C.B. M.A., Lord Justice of Appeal.
*27 Harrington Gardens, South Kensington; and Athenæum
Club, S.W.*
- 1863 Roscoe, Sir Henry Enfield, Knt., B.A. D.C.L. (Oxon.) LL.D. (Cantab. 1872
Dubl. Glasg. Montr.) Hon. M.D. (Heidelb.) Hon. D.Sc. 81
(Vict.) Ph.D. V.P.C.S. Officier Lég. Hon. France; Corresp. Inst. 89
Fr. (Acad. Sci.); Vice-Chancellor and Fellow of Univ. of Lond., V.
Fellow of Univ. Coll., and Eton College; Emeritus Professor of 1881
Chemistry in Victoria University (Owens College); Hon. Mem. 88
Literary and Phil Soc. Manchester; Hon. Mem. New York Acad.
Sci., Chem. Gesell. Berlin, Verein für Naturwiss. Brunswick, and
Physikal. Verein. Frankfort-on-Main; Corresp. K. Bayer. Akad.
Wiss. Munich, K. Gesell. Wiss. Göttingen, and Acad. Gioenia
Sci. Nat. Catania; Mem. K. Leop.-Carol. Akad. Halle, and
Physiogr. Sällsk. Lund. **Medal: Royal.** 10 *Bramham Gardens,
South Kensington, S.W.; and Athenæum Club.*
- 1896 Rosebery, Right Hon. Archibald Philip Primrose, Earl of, K.G. K.T.
D.C.L. Trust. Brit. Mus. 38 *Berkeley Square, W.; and Dalmeny
Park, Linlithgowshire.*
- 1901 Ross, Ronald, Major (I.M.S. retired), F.R.C.S. D.P.H. (United Colleges, .
Lond.) *School of Tropical Medicine, Liverpool.*
- 1867 Rosse, Laurence Parsons, Earl of, K.P. B.A. D.C.L. (Oxon.) LL.D. 1871
(Camb. and Dubl.) F.R.A.S. Chancellor of the University of 87
Dublin. *Birr Castle, Parsonstown, Ireland.* V.
1871 87
- 1872 Routh, Edward John, D.Sc. (Cantab. et Dubl.) LL.D. (Glasg.) M.A. 1888
(Lond.) Fellow of the University of London; Hon. Fellow St.
Peter's College, Cambridge; F.R.A.S. F.G.S. *Newnham Cottage,
Queen's Road, Cambridge.*
- 1884 Rücker, Arthur William, M.A. (Oxon.) D.Sc. (Vict.) LL.D. (Glasg.), 1887
Hon. Fellow of Brasenose Coll., Oxford; Principal and Fellow of 1894-
the University of London; Corr. Mem. Leeds Lit. and Phil. Soc.; Se
Hon. Mem. Royal Cornwall Polytechnic Society. **Medal: Royal.** 1896-
19 *Gledhow Gardens, South Kensington, S.W.; and Athenæum
Club, S.W.*
- 1886 Russell, Henry Chamberlaine, C.M.G. B.A. (Sydn.) F.R.A.S. F.R. Met. Soc. Government Astronomer of New South Wales. *The
Observatory, Sydney, N.S. Wales.*
- 1872 Russell, William James, Ph.D. V.P.C.S., late Lecturer on Chemistry 1885
at the Medical School of St. Bartholomew's Hospital. 34 *Upper 97
Hamilton Terrace, N.W.* V.
1897

- 1863 Salmon, Rev. George, D.D. (Dubl. et Edin.) D.C.L. (Oxon.) LL.D. (Cantab.) Provost of Trin. Coll. Dubl., Inst. Fr. (Acad. Sci.) Paris, Acad. Reg. Sci. Berol., Soc. Reg. Sci. Gött. Corresp.; Soc. Reg. Sci. Hafn. Soc. Extr. **Medals: Copley, Royal.** *Trinity College, Dublin.*
- 1881 Samuelson, Right Hon. Sir Bernhard, Bart., Mem. Inst. C.E. 1887
56 *Prince's Gate, S.W.*
- 1867 Sanderson, Sir J. S. Burdon, Bart., M.A. (Oxon.) M.D. LL.D. Sc.D. 1873
(Dubl.) LL.D. (Edin.) D.C.L. (Dunelm.) F.R.S.E. F.R.C.P. 84
Regius Professor of Medicine in the University of Oxford; Hon. 93
Fellow of Magdalen College; Corr. Mem. K. Preuss. Akad. Wiss. V.7
Berl.; Inst. Fr. (Acad. Sci.) **Medal: Royal.** 64 *Banbury* 1874
Road, Oxford. 94
- 1878 Schäfer, Edward Albert, M.R.C.S. LL.D. (Aberd.) Professor of 1890
Physiology in the University of Edinburgh. *The University,*
Edinburgh.
- 1901 Schlich, William, C.I.E. Ph.D. F.L.S. Principal Professor of Forestry
in the Royal Indian Engineering College, Cooper's Hill. *Engle-*
field Green, Surrey.
- 1850 Schunck, Edward, F.C.S. D.Sc. **Medal: Davy.** *Kersal, Manchester.*
- 1879 Schuster, Arthur, Ph.D. F.R.A.S. Mem. Inst. Elect. Eng., Phil. Soc. 1885
Camb., Roy. Phil. Soc. Glasg., Corr. Mem. Roy. Soc. Sci. Gött., 98
Professor of Physics in Owens College, Victoria University, Man-
chester. **Medal: Royal.** *Kent House, Victoria Park, Man-*
chester.
- 1861 Selater, Philip Lutley, M.A. D.Sc. (Oxon.) Ph.D. (Bonn) Hon. Fellow 1872
of Corpus Christi College, F.L.S. F.G.S. F.R.G.S., Secretary of the 86
Zoological Society of London. 3 *Hanover Square, W.; and*
Odiham Priory, Winchfield, Hants.
- 1898 Scott, Alexander, M.A. (Camb.) D.Sc. (Edin.) F.R.S.E. Sec. C.S.
Davy-Faraday Laboratory, Albemarle Street, W.
- 1894 Scott, Dukinfield Henry, M.A. (Oxon.) Ph.D. (Würzb.) F.L.S. F.G.S. 1897
Honorary Keeper of the Jodrell Laboratory, Royal Botanic Gar-
dens, Kew. *Old Palace, Richmond, Surrey.*
- 1870 Scott, Robert Henry, M.A. D.Sc. (Dubl.) F.Z.S. F.R. Met. Soc., late 1900
Secretary to the Meteorological Council. Officer of the Legion of
Honour; Ord. Coron. Ferr. Austr. Eq.; Acad. Cæs. Leop. Soc.;
Soc. Met. Fr. Par., Soc. Imp. Reg. Zool. Bot., Soc. Met. Austr.
Vindob., Soc. Met. Germ. Berol. et Soc. Nat. Scrutat. Emb. Soc.
Honor.; Inst. Geol. Imp. Vindob. Soc. Met. Ital. Taurin. et Soc.
Isis Dresd. Mem. Corr. 6 *Elm Park Gardens, S.W.*

- 1886 Sedgwick, Adam, M.A. Fellow, Tutor, and Lecturer of Trin. Coll., 188
Cambridge, and Reader of Animal Morphology in the University.
4 Cranmer Road, Cambridge.
- 1879 Seeley, Harry Govier, F.L.S. F.G.S. F.Z.S. F.R.G.S. Professor of
Geology and Geography with Mineralogy in King's College,
London; Lecturer on Geology and Mineralogy in the Royal
Indian Engineering College, Cooper's Hill; Inst. Imp. Reg.
Geol. Vindob. et Acad. Sci. Nat. Philad. Corresp.; Soc. Phil.
Ebor., Soc. Imp. Sci. Nat. Hist. Mosq. Soc., Senckenberg. Natur.
Gesell. Franf. Corresp. Hon. Mem. S. African Phil. Soc. 25
Palace Gardens Terrace, Kensington, W.
- 1900 Sell, William James, M.A. Senior Demonstrator of Chemistry in the
University of Cambridge. 11 *Downing Grove, Cambridge.*
- 1874 Selwyn, Alfred Richard Cecil, C.M.G. F.G.S., late Director of the
Geological Survey of Canada. *Robson Street, Vancouver, B.C.,
Canada.*
- 1898 Seward, Albert Charles, M.A. (Camb.) F.G.S. F.L.S. Fellow of
Emmanuel College; late Fellow of St. John's College; University
Lecturer in Botany, Cambridge. *Westfield, Huntingdon Road,
Cambridge.*
- 1890 Sharp, David, M.B. C.M. (Edin.) Hon. M.A. (Camb.) F.L.S. F.Z.S.
Hon. Mem. New Zealand Inst. *Museum of Zoology, Cambridge;
and Hawthorndene, Hills Road, Cambridge.*
- 1891 Shaw, William Napier, M.A. Fellow of Emmanuel College, Cam-
bridge; Secretary to the Meteorological Council. *Meteorological
Office, 63 Victoria Street; and 10 Moreton Gardens, South Ken-
sington, S.W.*
- 1898 Shenstone, William Ashwell, F.I.C. *Clifton College, Bristol; and
Glenfarg, Percival Road, Clifton, Bristol.*
- 1893 Sherrington, Charles Scott, M.A. M.D. (Camb.) Holt Professor of 1
Physiology in University College, Liverpool; Memb. Corr. Honor.
Soc. Neurol. Paris. 16 *Grove Park, Liverpool.*
- 1845 Simon, Sir John, K.C.B. F.R.C.S. D.C.L. (Oxon.) LL.D. (Cantab. et 1
Edin.) M.D. (Dubl.) M.Chir.D. (Munich), Consulting Surgeon to
St. Thomas's Hospital. **Medal: Buchanan.** 40 *Kensington
Square, W.*
- 1862 Simpson, Maxwell, B.A. M.B. Hon. M.D. & LL.D. (Dubl.) Hon. D.Sc.
Queen's Univ. Ireland, F.C.S. F.I.C. Hon. F.K.Q.C.P. (Dubl.)
Late Professor of Chemistry in Queen's College, Cork, late
Fellow of the Royal University of Ireland. 7 *Darnley Road,
Holland Park Avenue, W.*
- Smith (*see Jervis-Smith*).
- 1901 Smithells, Arthur, B.Sc. (Lond.) F.I.C. Professor of Chemistry in
the Yorkshire College, Leeds. *North Grange Road, Headingley,
Leeds.*
- 1887 Snelus, George James, A.R.S.M. Mem. Inst. M.E. Vice-Pres. Iron
and Steel Inst. *Ennerdale Hall, Frizington, Cumberland.*

- Professor of Geology in the University of Oxford; Fellow of University College, Oxford. 173 *Woodstock Road, Oxford.*
- 1857 Sorby, Henry Clifton, LL.D. (Cantab.) F.L.S. F.G.S. F.Z.S. F.S.A. 1876
F.R.M.S., Soc. Min. Petrop., Soc. Holland. Harl. Socius.; Acad. Lync. Romæ. Adsoc. Extr.; Amer. Acad. Arts et Sci. Soc. Honor.; Acad. Sci. Nat. Philad. et Acad. Sci. Nov. Ebor. Corr. Mem. **Medal: Royal.** *Broomfield, Sheffield.*
- 1900 Spencer, W. Baldwin, B.A. (Oxon.) M.A. (Melb.). Professor of Biology in the University of Melbourne; Fellow of Lincoln College, Oxford; Corr. Mem. Z.S. *The University, Melbourne, Victoria.*
- 1878 Sprengel, Hermann Johann Philipp, Ph.D. (Heidelb.) F.C.S. Royal Prussian Professor (titular). *Savile Club, 107 Piccadilly, W.*
- 1899 Starling, Ernest Henry, M.D. F.R.C.P. Jodrell Professor of Physiology in University College, London. 8 *Park Square West, Regent's Park, N.W.*
- 1896 Stebbing, Rev. Thomas Roscoe Rede, M.A. (Oxon.) B.A. (Lond.) F.L.S. F.Z.S., Fellow of King's Coll., London. *Ephraim Lodge, The Common, Tunbridge Wells.*
- 1896 Stewart, Charles, LL.D. (Aberd.) M.R.C.S. F.L.S. Conservator of the Museum of the Royal College of Surgeons, and Hunterian Professor of Human and Comparative Anatomy. 38 *Lincoln's Inn Fields, W.C.*
- 1898 Stirling, Edward Charles, C.M.G. M.A. M.D. (Camb.) F.R.C.S. C.M.Z.S. Late Surgeon, Adelaide Hospital; Professor of Physiology in the University of Adelaide; Director of the South Australian Museum. *The University, Adelaide, South Australia.*
- 1851 Stokes, Sir George Gabriel, Bart.—**Past President**—M.A. D.C.L. 1854
(Oxon.) LL.D. (Dubl. Edin. et Cant.) D.Sc. Lucasian Professor of Se
Mathematics in the University of Cambridge; F.C.P.S. F.R.S.E.; 1854
Hon. Memb. Inst. C.E.; Soc. Reg. Hib., Lit. et Phil. Manc. et Pre
Med. Chi. Lond. Soc. Honor.; Ord. Boruss. "*Pour le Mérite*" 1885
Eq.; Acad. Sci. Berol. Soc.; Acad. Imp. Sci. Vindob., Soc. Imp. V.I.
Nat. Sci. Mosquen. Soc. Honor.; Inst. Fr. (Acad. Sci.) Par., Reg. 1890
Taurin. Acad.; Soc. Reg. Sci. Gött. Corresp.; Soc. Gall. Phys.,
Reg. Sci. Upsal., Acad. Sci. Bavar. et Acad. Nov. Lync. Rom. Soc.
Extr.; Soc. Phil. Amer., Soc. Batav. Roterod. et Acad. Sci. Reg.
Boruss. Socius; Acad. Amer. Bost., Soc. Philos. Glasc., Mach.
Civ. Inst. et Soc. Asiat. Beng. Soc. Honor. **Medals: Copley,**
Rumford. *Lensfield, Cambridge; and Athenæum Club, S.W.*
- 1881 Stoney, Bindon Blood, LL.D. M.Inst.C.E. M.R.I.A. M.I.N.A. 1881
14 *Elgin Road, Dublin.*
- 1861 Stoney, George Johnstone, M.A. D.Sc. F.R.A.S. 30 *Ledbury Road, 1898-*
Notting Hill, W. V.I.
1899-

- 1854 Strachey, Sir Richard, Lieut.-General, R.E. G.C.S.I. LL.D. (Cantab.) F.G.S. F.L.S. Chairman of the Meteorological Council; Hon. Mem. Asiat. Soc. Bengal. **Medal: Royal.** 69 *Lancaster Gate, Hyde Park, W.*
- 1888 Sudeley, Charles Douglas Richard Hanbury-Tracy, Lord. *Ormeley Lodge, Ham Common, Surrey.*
- 1894 Swan, Joseph Wilson, D.Sc. M.A. (Durh.) F.C.S. F.I.C. Past President Inst. Elec. Eng. Vice-Pres. Senate Univ. Coll. Lond.; Vice-Pres. Lit. and Phil. Soc. Newcastle; Cor. Mem. Phil. Soc. Glasgow; Chev. de la Légion d'Honneur. 58 *Holland Park, W.*
- 1899 Tanner, Henry William Lloyd, D.Sc. (Oxon.) F.R.A.S. A.R.S.M. Professor of Mathematics and Astronomy in the University College of South Wales and Monmouthshire. 27 *Cwrt-y-Fil Road, Penarth, Glamorgan.*
- 1898 Taylor, Henry Martyn. Fellow of Trinity College, Cambridge. *The Yews, Queen's Road, Cambridge.*
- 1888 Teale, Thomas Pridgin, M.A. F.R.C.S. 38 *Cookridge Street, Leeds.*
- 1890 Teall, J. J. H., M.A. F.G.S. Director-General of the Geological Survey of the United Kingdom, and of the Museum of Practical Geology, London. 89 *Thurlow Park Road, West Dulwich, S.E.; Geological Museum, Jermyn Street; and Athenæum Club, S.W.*
- 1896 Temple, Right Hon. Sir Richard, Bart., G.C.S.I. C.I.E. D.C.L. (Oxon.) LL.D. (Cantab. et Univ. McGill). *Heath Brow, Hampstead Heath, N.W.; The Nash, Kempsey, Worcestershire; and Athenæum Club, S.W.*
- 1869 Tennant, James Francis, Lieut.-General, R.E. C.I.E. F.R.A.S. 11 *Clifton Gardens, Maida Hill, W.*
- 1880 Thiselton-Dyer, Sir William Turner, K.C.M.G. C.I.E. M.A. (Oxon.) B.Sc. (Lond.) Ph.D. LL.D. (Glasg.) F.L.S. Director Royal Botanic Gardens, Kew; Hon. Student of Christ Church, Oxford; late Fellow Univ. of London; Hon. Fellow, King's Coll., Lond., Bot. Soc. Edin.; Hon. Mem. Roy. Bot. Soc. Lond., Pharm. Soc. Gt. Britain, Camb. Phil. Soc., Lit. Phil. Soc. Manchester, Soc. Néerland. d'Hort. et de Bot., New Zealand Institute, Roy. Soc. N.S.W., Dominico Agric. Soc.; Corresp. Acad. Sci. Philad., Boston Soc. Nat. Hist., Hort. Soc. Berlin and Massachusetts, Soc. Nat. Sci. et Math. de Cherb., and Botan. Soc. Copenhagen; Mem. Assoc. Soc. Roy. de Bot. de Belgique; Mitg. Kais.-Leop.-Carol. Deutsch. Acad. der Naturf. in Halle. *Royal Gardens, Kew.*
- 1901 Thomas, M. R. Oldfield, F.Z.S. F.R.G.S. Senior Assistant in the Zoological Department of the British Museum. 9 *St. Petersburg Place, Bayswater, W.*

1891. Thompson, Silvanus Phillips, B.A. D.Sc. (Lond.), M.D. (Königsberg), F.R.A.S. Reg. Acad. Sci. Suec. Soc., Phys. Verein, Francof. ad Mœnum. Soc. Honor. Soc. Phil. Ebor. Soc. Honor., Pres. Phys. Soc. Lond., Principal and Professor of Physics in the City and Guilds of London Technical College, Finsbury. *Morland, Chislett Road, West Hampstead, N.W.*
- 1897 Thomson, John Millar, LL.D. (Glasg.) F.C.S. Professor of Chemistry in King's College, London. 85 *Addison Road, Kensington, W.*
- 1884 Thomson, Joseph John, M.A. Sc.D. (Dubl.) D.Sc. (Vict.) LL.D. (Glasg. 1889-90
Princeton) Hon. Mem. Lit. Phil. Soc. Manc., Roy. Dubl. Soc., R. 1898-1900
Accad. Sci. Turin, K. Vetensk.-Soc. Upsala; Fellow of Trinity College and Cavendish Professor of Experimental Physics, Cambridge. **Medal: Royal.** *Trinity College, Cambridge.*
- 1893 Thornycroft, John Isaac, M. Inst. C.E. *Eyot Villa, Chiswick Mall, Chiswick.*
- 1876 Thorpe, Thomas Edward, C.B.—**Foreign Secretary**—D.Sc. (Vict.) 1890-91
Sc.D. (Dubl.) Ph.D. (Heid.) LL.D. (Glasg.) V.P.C.S. Principal 93-94
of the Government Laboratories; Fellow of the University of 99-
London; Hon. Fellow Roy. Soc. Edin.; Past Pres. Soc. Chem. V.P.
Indust.; Soc. Chem. Berol. Socius; Soc. Phil. Glasg. Mem. 1894-95
Corr.; Soc. Phil. Leeds, Soc. Lit. Phil. Manc., Soc. Pharm. Soc. For. S.
Honor.; Soc. Bat. Sci. Harl. Soc. Extr. **Medal: Royal.** *Government 1899-
Laboratories, Clement's Inn Passage, Strand, W.C.; and
Athenæum Club, S.W.*
- 1899 Threlfall, Richard, M.A. 30 *George Road, Edgbaston, Birmingham.*
- 1869 Thuillier, Sir Henry Edward Landor, General, R.A. C.S.I. F.R.G.S. *Tudor House, Richmond, Surrey.*
- 1880 Tilden, William Augustus, D.Sc. (Lond.) Sc.D. (Dubl.) F.C.S. F.I.C. 1892-93
Professor of Chemistry in the Royal College of Science, London; Hon. Mem. Pharm. Soc., Soc. Pub. Anal., Soc. Nat. Bristol, Phil. Soc. Birmingham. Coll. Pharm. Philad. *The Oaks, Northwood, Middlesex.*
- 1891 Tizard, Thomas Henry, Captain R.N. C.B. F.R.G.S. Assistant Hydrographer of the Admiralty. *Hydrographic Department, Admiralty, Whitehall, S.W.*
- 1889 Todd, Sir Charles, M.A. (Camb.) K.C.M.G. F.R.A.S. Postmaster-General, Superintendent of Telegraphs and Government Astronomer, South Australia. *The Observatory, Adelaide, South Australia.*
- 1878 Tomes, Charles Sissmore, M.A. (Oxon.). 9 *Park Crescent, Portland Place, W.*
- 1889 Tomlinson, Herbert, B.A. (Oxon.). 97 *Albert Bridge Road, S.W.*
- 1893 Trail, James William Helenus, A.M. M.D. C.M. (Aberd.) F.L.S. Regius Professor of Botany in the University of Aberdeen. *The University, Aberdeen, N.B.*
- 1881 Traquair, Ramsay H. M.D. LL.D. F.R.S.E. F.G.S. Keeper of the Natural History Collections in the Museum of Science and Art, Edinburgh. 8 *Dean Park Crescent, Edinburgh.*

- 1883 Trimen, Roland, Hon. M.A. (Oxon.) F.L.S. F.Z.S. F.E.S. Hon. Mem. South African Phil. Soc. and Soc. Imp. Amis. Sci. Nat. de Mosc.; late Curator of the South African Museum. 19 *Emperor's Gate*, S.W.
- 1868 Tristram, Rev. Henry Baker, M.A. (Oxon.) LL.D. (Edin. and St. Andrews) D.D. C.M.Z.S. Canon of Durham. *College, Durham*.
- 1897 Trouton, Frederick Thomas, M.A. Sc.D. (Dubl.) Quain Professor of Physics in University College, London. *University College, Gower Street, W.C.*
- 1897 Turner, Herbert Hall, D.Sc. F.R.A.S. Savilian Professor of Astronomy in the University of Oxford. *University Observatory, Oxford*.
- 1877 Turner, Sir William, K.C.B. M.B. (Lond.) D.C.L. (Durh. Toronto and Oxf.) LL.D. (Glasg. and Univ. McGill) Sc.D. (Camb. and Dubl.) F.R.C.S. (Edin.) F.R.S.E.; Hon. Assoc. Ord. Hosp. St. John, Jerusalem; President of the General Medical Council; Professor of Anatomy in the University of Edinburgh; Hon. Prof. Anat. Roy. Soc. Acad.; Hon. Mem. Roy. Irish Acad.; Hon. Fell. Roy. Med. Chir. Soc. London; Hon. Fell. Obst. Soc. Lond. and Edin.; For. Assoc. Anthropol. Soc. Paris; Corr. Mem. Akad. Wiss. Berlin, Soc. Anthropol. Ethnol. and Prehist. Arch. Berlin. Corr. Mem. Soc. Anthropol. Rome; Hon. Mem. Imp. Milit. Acad. Med. St. Petersburg. 6 *Eton Terrace, Edinburgh; and Athenæum Club, S.W.*
- 1899 Tutton, Alfred E., B.Sc. F.C.S. A.R.C.S. 17 *Bardwell Road, Oxford*.
- 1871 Tylor, Edward Burnett, D.C.L. (Oxon.) LL.D. (St. And. Aberd. and McGill) Assoc. Acad. Reg. Belg. Professor of Anthropology in the University of Oxford. *Museum House, Oxford*.
- 1886 Unwin, W. Cawthorne, B.Sc. Mem. Inst. C.E.; Hon. Mem. Inst. M.E.; Mem. Amer. Phil. Soc.; Hon. Mem. Amer. Soc. Mech. Eng.; Professor of Engineering at the Central Technical College of the City and Guilds of London Institute. *Palace Gate Mansions, 29 Palace Gate, Kensington, W.*
- 1894 Veley, Victor Herbert, M.A. D.Sc. 20 *Bradmore Road, Oxford*.
- 1888 Venn, John, Sc.D. *Vicarsbrook, Chaucer Road, Cambridge*.
- 1885 Vines, Sydney Howard, M.A. (Oxon.) D.Sc. (Camb. and Lond.) P.L.S. Sherardian Professor of Botany in the University of Oxford; Fellow of Magdalen College, Oxford; Hon. Fellow of Christ's College, Cambridge; Hon. Mem. Manc. Lit. Phil. Soc. and Roy. Phys. Soc. Edin.; Corr. Mem. Soc. Nat. Sci. et Math. de Cherb., Soc. Roy. Bot. de Belg., and Soc. Nat. Hist. Bost. *Headington Hill, Oxford*.
- 1900 Walker, James, D.Sc. (Edin.) Ph.D. (Leipz.) Professor of Chemistry in University College, Dundee. 19 *Springfield, Dundee*.
- 1893 Wallace, Alfred Russel, LL.D. D.C.L. F.L.S. F.Z.S. **Medals: Royal, Darwin.** *Corfe View, Parkstone, Dorset*.

- 1887 Walsingham, Thomas de Grey, Lord, M.A. LL.D. High Steward of the University of Cambridge; Trust. Brit. Mus.; F.L.S. F.Z.S. F.E.S.; Mem. Soc. Ent. de France, Ent. Ver. zu Berlin, Netherlands Ent. Ver., Soc. Ent. de Russie, Linn. Soc. N.S.W. *Merton Hall, Thetford, Norfolk.* 1896-
- 1888 Ward, Harry Marshall, D.Sc. F.L.S. Fellow of Sidney Sussex College, and Hon. Fellow of Christ's College, Cambridge; Professor of Botany in the University of Cambridge. **Medal: Royal.** *Botanical Laboratory, New Museums, Cambridge.* 1895-
- 1886 Warington, Robert, M.A. (Oxon.) F.C.S. late Sibthorpe Professor of Rural Economy in the University of Oxford. *High Bank, Harpenden, Herts.*
- 1884 Warren, Sir Charles, Lieut.-General, R.E. G.C.M.G. K.C.B. *10 Wellington Crescent, Ramsgate; and Athenæum Club, S.W.*
- 1881 Watson, Rev. Henry William, D.Sc. *The Rectory, Berkeswell, Coventry.*
- 1901 Watson, William, B.Sc. A.R.C.S. (Lond.) Assistant Professor of Physics in the Royal College of Science, London. *7 Upper Cheyne Row, Chelsea, S.W.*
- 1900 Watts, Philip. *10 Chelsea Embankment, S.W.*
- 1890 Weldon, Walter Frank Raphael, M.A. D.Sc., late Fellow of St. John's College, Cambridge; Fellow of Merton College and Linacre Professor of Human and Comparative Anatomy in the University of Oxford. *Merton Lea, Oxford.* 1896-
- 1886 Wharton, Sir William James Lloyd, Rear-Admiral, K.C.B. F.R.A.S. F.R.G.S. Hydrographer of the Admiralty. *Florys, Prince's Road, Wimbledon Park; and Athenæum Club, S.W.* 1888-95
- 1901 Whetham, William Cecil Dampier, M.A. Lecturer in Physics and Fellow of Trinity College, Cambridge. *5 St. Peter's Terrace, Cambridge.*
- 1887 Whitaker, William, B.A. F.G.S. Assoc. Inst. C.E. Corr. Acad. Nat. Sci. Philad., Hon. Mem. Soc. Belg. de Géol. *3 Campden Road, Croydon.*
- 1888 White, Sir William Henry, K.C.B. LL.D. (Glasg.) D.Sc. (Camb.) F.R.S.E. Mem. Inst. C.E. Fellow Royal School of Naval Architecture; V.P. Inst. Naval Architects; Past. Pres. Inst. Mech. Eng.; For. Mem. Roy. Acad. Sci. Sweden; late Assistant Controller and Director of Naval Construction. *39 Roland Gardens, S.W.; and Athenæum Club, S.W.* 1894
- 1886 Wilde, Henry, D.Sc. Past. Pres. Lit. Phil. Soc. Manch., Hon. Mem. Inst. Electr. Engs. *The Hurst, Alderley Edge, Cheshire.*
- 1870 Wilks, Sir Samuel, Bart. M.D. LL.D. F.R.C.P. late Pres. R. Coll. 1899-1900. Phys. Consulting Physician to Guy's Hospital. *8 Prince Arthur Road, Hampstead, N.W.*

- 1862 Williams, C. Greville, F.C.S. F.I.C. 21 *Bournevale Road, Streatham, S.W.*
- 1855 Williamson, Alexander William, Ph.D. (Giessen) D.C.L. (Dunelm.) LL.D. (Dubl. et Edin.) F.R.S.E. V.P.C.S. Hon. Mem. R.I.A. Fellow of the Univ. of Lond.; Emeritus Prof. of Chemistry in Univ. Coll. Lond.; Inst. Fr. (Acad. Sci.), Acad. Reg. Sci. Taurin., Soc. Biol. Paris, Corresp.; Acad. Reg. Sci. Berol., Acad. Lync. Romæ, Soc. Reg. Sci. Gött. Soc. Extr.; Soc. Chem. Berol. et Amer. Nov. Ebor., Soc. Lit. Phil. Manc. Soc. Honor. **Medal: Royal.** *High Pitfold, Shottermill, Haslemere.*
- 1879 Williamson, Benjamin, D.Sc. D.C.L. (Oxon.) M.R.I.A. Senior Fellow of Trinity College, Dublin. *Trinity College, Dublin.*
- 1874 Wilson, Sir Charles William, Major-General, R.E. K.C.B. K.C.M.G. D.C.L. (Oxon.) LL.D. (Edin.) M.E. (Dubl.) F.R.G.S. *Athenæum Club, S.W.*
- 1855 Wilson, George Fergusson, F.C.S. F.L.S. *Heatherbank, Weybridge Heath, Surrey.*
- 1896 Wilson, William E., D.Sc. (Dubl.) M.R.I.A. F.R.A.S. *Daramona, Streete, Westmeath, Ireland.*
- 1900 Wilson, Charles Thomson Rees, M.A. (Camb.) B.Sc. (Vict.) *Sidney Sussex College, Cambridge.*
- 1898 Wimshurst, James, Mem. Inst. Elect. Eng. 7 *Crescent Grove, Clapham Common, S.W.*
- 1899 Windle, Bertram Coghill Alan, M.A. M.D. Sc.D. (Dubl.) M.Sc. (Birm.) F.S.A. F.R.S. Antig. Ireland; Professor of Anatomy and Dean of the Medical Faculty, University of Birmingham. *Weatherbury, Harborne, Birmingham.*
- 1895 Wolfe Barry, Sir John, K.C.B. LL.D. Past. Pres. Inst. C.E. 23 *Delahay Street, Westminster, S.W.*
- 1901 Woodward, Arthur Smith, LL.D. F.L.S. F.G.S. F.Z.S. F.R.G.S. Keeper of the Department of Geology, British Museum (Natural History). 4 *Scarsdale Villas, Kensington, W.*
- 1878 Woodward, Henry, LL.D. (St. And.) F.G.S. V.P.Z.S. F.R.M.S. Pres. Palæont. Soc. V.P. Malacol. Soc. Lond. Acad. Sci. Nov. Ebor. Soc. Phil. Amer. Philad. Soc.; Soc. Phil. Ebor., Assoc. Geol. Lond., Soc. Geol. Edin., Glasc., Liverp. et Nordov. Soc. Honor.; Soc. Géol. Belg., Imp. Nat. Hist. Mosq., Hist. Nat. Montreal et Malacol. Belg. Corresp.; late Keeper of the Department of Geology, British Museum (Natural History). 129 *Beaufort Street, Chelsea, S.W.*
- 1896 Woodward, Horace Bolingbroke, F.G.S., Assistant Director of the Geological Survey. Hon. Mem. Norfolk Nat. Soc. and Yorksh. Phil. Soc. 8 *Inglewood Road, West Hampstead, N.W.; and Geological Survey, Jermyn Street, S.W.*
- 1893 Worthington, Arthur Mason, M.A. F.R.A.S. Headmaster and Professor of Physics, Royal Naval Engineering College, Devonport. *Mohuns, Tavistock.*

- 1888 Yeo, William Francis, D.Sc. (Lond.) F.R.C.S. F.I.C. A.M.C.S.
Assistant Professor of Chemistry in the Royal College of Science,
London. *Royal College of Science, South Kensington, S.W.*
- 1889 Yeo, Gerald Francis, M.D. (Dublin) F.R.C.S. Emeritus Professor of
Physiology in King's College, London. *Bowden, Totnes, South
Devon.*
- 1893 Young, Sydney, D.Sc. (Lond.) F.C.S. F.I.C. Professor of Chemistry
in University College, Bristol. *6 Windsor Terrace, Clifton,
Bristol.*

FOREIGN MEMBERS.

Date of Election.		Medal.
1891.	Agassiz, Alexander. <i>Cambridge, Mass., U.S.A.</i>	
1897.	Amagat, Émile Hilaire. <i>École Polytechnique, Paris</i>	
1879.	Auwers, Georg Friedrich Julius Arthur, <i>Lindenstrasse, 91, Berlin</i>	
1885.	Baeyer, Adolf von. <i>Universität, Munich</i>	Davy.
1877.	Berthelot, Marcellin. <i>Secrétariat de l'Institut, Paris</i>	Copley, Davy.
1899.	Boltzmann, Ludwig. <i>Vienna</i>	
1889.	Cannizzaro, Stanislao. <i>Reale Università, Rome</i>	Copley.
1889.	Chauveau, Jean Baptiste Auguste. <i>Avenue Jules Janin, 10, Paris</i>	
1884.	Cornu, Alfred. <i>Rue de Grenelle, 9, Paris</i>	Rumford.
1879.	Cremona, Luigi. <i>S. Pietro in Vincoli, Rome</i>	
1899.	Dohrn, Anton. <i>Naples</i>	
1899.	Fischer, Emil. <i>Berlin</i>	
1895.	Gaudry, Albert. <i>Rue des Saints-Pères, 7 bis, Paris</i>	
1884.	Gegenbaur, Carl. <i>Leopoldstrasse, 57, Heidelberg</i>	Copley.
1897.	Gibbs, J. Willard, <i>Yale College, New Haven, Conn.</i>	Copley.
1896.	Heim, Albert. <i>Hochschule, Zürich</i>	
1897.	Hoff, J. H. van't. <i>Universität, Berlin</i>	
1875.	Janssen, Pierre Jules César. <i>Observatoire de Meudon, Paris</i>	Rumford.
1885.	Klein, Felix. <i>Weender Chaussee, 6, Göttingen</i>	
1897.	Koch, Robert. <i>Universität, Berlin</i>	
1895.	Kohlrausch, Friedrich. <i>Physikalisch-Technische Reichsan- stalt, Berlin</i>	
1860.	Kölliker, Albert von. <i>Universität, Würzburg</i>	Copley.
1895.	Langley, Samuel Pierpont. <i>Smithsonian Institution, Washing- ton, U.S.A.</i>	
1901.	Leydig, Franz von. <i>Rothenberg a.d. T.</i>	
1896.	Lippmann, Gabriel. <i>Faculté des Sciences à la Sorbonne, Paris</i>	
1892.	Mascart, Éleuthère Élie Nicolas. <i>Rue de l'Université, 176, Paris</i>	

1892.	Mendeleeff, Dmitri Ivanovitch. 19, Zabalkansky, St. Petersburg	Davy.
1895.	Metschnikoff, Elias. Institut Pasteur, Paris	
1896.	Mittag-Leffler, Gösta. Höskolan, Stockholm	
1899.	Neumayer, Georg. Hamburg	
1877.	Newcomb, Simon. 1620, P Street, Washington, U.S.A.	Copley.
1897.	Pfeffer, Wilhelm. Universität, Leipzig	
1888.	Pfüger, Eduard Friedrich Wilhelm. Universität, Bonn, Germany	
1894.	Poincaré, Henri. École Polytechnique, Paris	Sylvester.
1879.	Quinke, Georg Hermann. Friedrichsbau, Heidelberg	
1896.	Schiaparelli, Giovanni. R. Osservatorio Astronomico di Brera, Milan	
1891.	Strasburger, Eduard. Universität, Bonn	
1873.	Struve, Otto Wilhelm. Fahnstrasse, 8, Carlsruhe, Germany..	
1894.	Suess, Eduard. Geologisches Museum, Vienna	
1891.	Tacchini, Pietro. Ufficio Meteorologico Centrale, Roma	Rumford.
1899.	Traub, Melchior. Buitenzorg	
1884.	Virchow, Rudolf. Universität, Berlin	Copley.
1897.	Wislicenus, Johannes. Universität, Leipzig	Davy.
1897.	Zirkel, Ferdinand. Universität, Leipzig	

**FELLOWS DECEASED BETWEEN THE ANNIVERSARY,
NOVEMBER 30, 1900, AND JANUARY 1, 1902.**

Patron.

Her Sacred Majesty Queen Victoria.

On the Home List.

Armstrong, William George, Lord, C.B.	Hennessy, Henry G., M.R.I.A.
Conroy, Sir John, Bart., M.A.	Jones, John Viriamu, M.A.
Dawson, George Mercer, C.M.G.	Malet, John Christian, M.A.
FitzGerald, George Francis, D.Sc.	Meldrum, Charles, C.M.G.
Gilbert, Sir Joseph Henry, M.A.	Pole, William, Mus. Doc.

On the Foreign List.

Hermite, Charles.
Kowalewski, Aleksandr.
Lacaze-Duthiers, Henri de.
Rowland, Henry A.

CHANGE OF TITLE.

Goschen, Right Hon. George Joachim, *to* Goschen, Viscount.

**FELLOWS ELECTED BETWEEN THE ANNIVERSARY,
NOVEMBER 30, 1900, AND JANUARY 1, 1902.**

1901. Alcock, Prof. Alfred William, M.B.	1901. Ross, Ronald, Major (I.M. retired)
1901. Dyson, Frank Watson, M.A.	1901. Schlich, Prof. William, C.I.B.
1901. Evans, Arthur John, M.A.	1901. Smithells, Prof. Arthur, B.Sc.
1901. Gregory, Prof. John Walter, D.Sc.	1901. Thomas, Michael R. Oldfield, F.Z.S.
1901. Jackson, Henry Bradwardine, Capt., R.N.	1901. Watson, William, B.Sc.
1901. Macdonald, Hector Munro, M.A.	1901. Whetham, William C. Dampier, M.A.
1901. Mansergh, James, M.Inst.C.E.	1901. Woodward, Arthur Smith, F.G.S.
1901. Martin, Prof. Charles James, M.B.	

On the Foreign List.

Leydig, Franz von.

COMMITTEES, 1902.

"Chairman," as used below, is to be understood as the Fellow appointed act as Chairman in the absence of the President, who by Statute presides all Meetings of Committees.

The Treasurer, Secretaries, and Foreign Secretary shall be considered as officio members of all Committees (excepting the Scientific Relief Committee the Sectional Committees, and any Committees composed of representatives the Royal and other Societies jointly).

Each Committee, with the exceptions stated above, shall have power to add its number, provided that any persons so added, if not Fellows of the Royal Society, shall be called "accessory members."

SECTIONAL COMMITTEES.

1. Mathematics Committee :—

(Two to retire each year.)

Chairman—Prof. Elliott.

	To serve.			
Dr. Routh	1 year.	Retires	Dec.,	1902.
Prof. Lamb.....	1 "	"	"	"
" Greenhill	2 years.	"	"	1903.
" Elliott	2 "	"	"	"
Dr. Hobson	3 "	"	"	1904.
Prof. Love	3 "	"	"	"

2. Physics and Chemistry Committee :—

(Four to retire each year.)

Chairman—Prof. Clifton.

	To serve.			
Mr. Dunstan	1 year.	Retires	Dec.,	1902.
Prof. Fleming	1 "	"	"	"
" Turner	1 "	"	"	"
" Lodge	1 "	"	"	"

	To serve.			
Prof. Callendar	2 years.	Retires	Dec., 1903.	
„ Clifton	2 „	„	„	„
„ J. J. Thomson	2 „	„	„	„
Dr. Wynne.....	2 „	„	„	„
Prof. Frankland.....	3 „	„	„	1904.
Mr. A. V. Harcourt	3 „	„	„	„
Prof. Schuster	3 „	„	„	„
Mr. W. N. Shaw	3 „	„	„	„

3. Geology Committee :—

(Three to retire each year.)

Chairman—Prof. Bonney.

	To serve.			
Dr. Hinde	1 year.	Retires	Dec., 1902.	
Prof. Judd	1 „	„	„	„
Adm. Sir G. S. Nares ...	1 „	„	„	„
Prof. Bonney	2 years.	„	„	1903.
Sir A. Geikie	2 „	„	„	„
Prof. Lapworth	2 „	„	„	„
Sir J. Kirk... ..	3 „	„	„	1904.
Mr. Marr	3 „	„	„	„
Prof. Sollas	3 „	„	„	„

4. Botany Committee :—

(Three to retire each year.)

Chairman—Mr. F. Darwin.

	To serve.			
Mr. Carruthers	1 year.	Retires	Dec., 1902.	
Mr. F. Darwin	1 „	„	„	„
Prof. Vines.....	1 „	„	„	„
„ Balfour	2 years.	„	„	1903.
Mr. G. Murray	2 „	„	„	„
Mr. Seward	2 „	„	„	„
Mr. H. T. Brown	3 „	„	„	1904.
Prof. Farmer	3 „	„	„	„
Mr. Hemsley	3 „	„	„	„

5. Zoology Committee :—

(Three to retire each year.)

Chairman—Prof. Herdman.

	To serve.			
Mr. Boulenger	1 year.	Retires	Dec.,	1902.
Prof. Herdman	1	"	"	"
" Poulton.....	1	"	"	"
Mr. Bateson	2 years.	"	"	1903.
Prof. Lankester	2	"	"	"
Rev. T. R. R. Stebbing ...	2	"	"	"
Mr. Harmer	3	"	"	1904.
Prof. Hickson	3	"	"	"
Mr. Lydekker	3	"	"	"

6. Physiology Committee :—

(Four to retire each year.)

Chairman—Prof. Bradford.

	To serve.			
Prof. Bradford	1 year.	Retires	Dec.,	1902
Dr. Haldane	1	"	"	"
" Mott	1	"	"	"
Prof. Starling.....	1	"	"	"
Dr. L. Hill	2 years.	"	"	1903.
" Manson	2	"	"	"
" Pavy	2	"	"	"
Sir J. Burdon-Sanderson..	2	"	"	"
Lieut.-Col. Bruce	3	"	"	1904.
Prof. Gotch	3	"	"	"
Dr. Klein	3	"	"	"
" Waller... ..	3	"	"	"

LIBRARY COMMITTEE.

Chairman—Prof. Carey Foster.

Prof. W. Grylls Adams, Prof. Bonney, Mr. Christie, Prof. C. Foster, Prof. Greenhill, Prof. Halliburton, Prof. McLeod, Dr. Müller, Prof. A. Newton, Prof. D. Oliver, Dr. Sclater, and Prof. S. Thompson, with power to add to their number, and with power to expend not exceeding £250 in the purchase of books, and a sum not exceeding £150 in binding books belonging to the Society.

SOIRÉE COMMITTEE.

Chairman—Sir W. Roberts-Austen.

Mr. Boys, Prof. Callendar, Sir W. Crookes, Sir J. Evans, Prof. H. Howes, Prof. Lankester, Dr. H. Müller, Prof. Perry, Sir W. H. Preece, Sir W. C. Roberts-Austen, Dr. D. H. Scott, Dr. R. H. Scott, Mr. W. Shaw, Mr. J. W. Swan, and Dr. H. Woodward, of whom three, to be determined by least attendance, retire annually.

HOUSE COMMITTEE.

Chairman—The Treasurer.

Prof. Ayrton, Prof. Ewing, Sir W. H. Preece, and Prof. S. Thompson (with the Treasurer as Vice-Chairman).

CATALOGUE OF SCIENTIFIC PAPERS COMMITTEE.

Chairman, Sir John Evans.

Prof. Armstrong, Dr. W. T. Blanford, Sir John Evans, Prof. J. Klein, Sir J. N. Lockyer, Prof. McKendrick, Mr. McLachlan, Prof. McLeod, Dr. Mond, Sir W. H. Preece, Sir W. C. Roberts-Austen, Dr. Routh, Dr. D. H. Scott, and Prof. Tilden.

“CHALLENGER” COMMITTEE.

Chairman—Sir J. D. Hooker.

Sir J. D. Hooker, Prof. Lankester, Sir J. Murray, and Sir W. Thiselton-Dyer.

SCIENTIFIC RELIEF COMMITTEE.

Chairman—Prof. Bonney.

Sir T. L. Brunton, Major P. A. MacMahon, Prof. A. Newton, Dr. L. Mond, Dr. R. H. Scott, Dr. P. H. Pye-Smith, Prof. T. G. Bonney, Prof. W. A. Tilden, Dr. W. T. Blanford, and Dr. W. J. Russell.

JOINT PERMANENT ECLIPSE COMMITTEE.

(On the part of the Royal Society.)

Sir W. de W. Abney, Mr. Christie, Dr. Common, Sir J. N. Lockyer, Major MacMahon, Prof. Schuster, Sir G. G. Stokes, Dr. G. J. Stone, Gen. Tennant, Dr. Thorpe, and Adm. Sir W. J. L. Wharton.

CORAL REEF COMMITTEE.

Chairman—Prof. Bonney.

Prof. Armstrong, Prof. Bonney, Sir W. Crookes, Mr. F. Darwin, Sir J. Evans, Sir A. Geikie, Dr. G. J. Hinde, Prof. Judd, Prof. Lankester, Prof. Lapworth, Sir J. Murray, Prof. Sollas, Dr. Sorby, Mr. Teall, Adm. Sir W. J. L. Wharton, and Sir J. Wolfe-Barry, with Capt. A. M. Field and Prof. W. W. Watts as accessory members.

TSETSE FLY COMMITTEE.

Chairman—Lord Lister.

Prof. Bradford, Lieut.-Col. Bruce, Sir J. Kirk, Prof. Lankester, Lord Lister, and Sir J. Burdon-Sanderson, with Mr. Plimmer as accessory member.

EVOLUTION COMMITTEE.

Chairman—Mr. F. D. Godman

Mr. W. Bateson, Mr. Burbury, Mr. F. Darwin, Prof. Ewart, Mr. F. D. Godman, Prof. Lankester, Prof. Macalister, Mr. McLachlan, Dr. Masters, and Prof. Poulton, with Sir E. Clarke and Mr. W. Heape as accessory members.

GOVERNMENT GRANT REVIEW COMMITTEE.

Chairman—Dr. H. Müller.

Prof. Bonney, Prof. Halliburton, Dr. H. Müller, Mr. W. D. Niven, Prof. Reinold, Dr. Russell, and Dr. D. H. Scott.

OBSERVATORIES COMMITTEE.

Chairman—The Astronomer Royal.

The Astronomer Royal, the President of the Royal Astronomical Society, Sir W. de W. Abney, Prof. G. H. Darwin, Sir J. N. Lockyer, Prof. A. W. Rücker, Sir G. G. Stokes, and Gen. Sir R. Strachey.

MALARIA COMMITTEE.

Chairman—Lord Lister.

Prof. Clifford Allbutt, Prof. Bradford, Lieut.-Colonel D. Bruce, Sir J. Kirk, Prof. E. R. Lankester, Lord Lister, Dr. Manson, Major H. Ross, Sir J. Burdon-Sanderson, and Prof. Sherrington, with Mr. C. I. Lucas of the Colonial Office.

Sir R. Giffen, Dr. Mond, Dr. Müller, Dr. R. H. Scott, and Mr. J. W. Swan.

INDIAN GOVERNMENT ADVISORY COMMITTEE.

Chairman—Gen. Sir R. Strachey.

Dr. Blanford, Mr. H. T. Brown, Gen. Sir R. Strachey, Sir W. T. Thiselton-Dyer, and Prof. H. M. Ward.

JOINT ANTARCTIC COMMITTEE.

(On the part of the Royal Society.)

The President, The Treasurer, Sir M. Foster, Prof. Rücker, Dr. A. Buchan, Capt. Creak, Sir J. Evans, Sir A. Geikie, Prof. Herdman, Sir J. D. Hooker, Prof. Poulton, Mr. P. L. Selater, Dr. R. H. Scott, Mr. J. J. H. Teall, Capt. Tizard, and Adm. Sir W. J. L. Wharton.

MACKINNON BEQUEST COMMITTEE.

Mr. H. T. Brown, Prof. Dewar, Prof. Herdman, Mr. J. J. H. Teall, and Prof. J. J. Thomson.

HUGHES BEQUEST COMMITTEE.

Prof. G. C. Foster, Sir A. Noble, Sir W. H. Preece, Sir W. C. Roberts-Austen, Mr. J. W. Swan, and Prof. J. J. Thomson.

INTERNATIONAL EXPLORATION OF THE SEA COMMITTEE

Chairman—Prof. McIntosh.

Prof. Herdman, Prof. Lankester, Prof. McIntosh, and Sir John Murray.

INTERNATIONAL ASSOCIATION OF ACADEMIES COMMITTEE.

Prof. Armstrong, Prof. Forsyth, Sir A. Geikie, Lord Kelvin, Prof. Lankester, Sir N. Lockyer, Prof. A. W. Rücker, Prof. Schuster, Prof. Sherrington, and Dr. Waller.

STATUTES OF THE ROYAL SOCIETY.

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CHAPTER I.

Of the Election and Admission of Fellows.

I. No person shall be proposed, elected, or admitted a Fellow of the Society on the day of the Anniversary Meeting for electing the Council and Officers.

II. Every Fellow, previously to his proposing a person as Candidate for Election, shall inform him of the Obligation to be subscribed, of the sum to be paid for admission money, and of the payments to be made to the Society, before he can be admitted a Fellow.

III. Every such Candidate shall be proposed and recommended by a certificate in writing signed by six or more Fellows, of whom three at least shall certify their recommendation from personal knowledge. The certificate shall specify the name, rank, profession, qualifications, and usual place of residence of the Candidate; and be delivered to one of the Secretaries, or to the Assistant Secretary.

ordered, shall be suspended in some convenient place in the apartments of the Society until the day of election.

IV. Any one of Her Majesty's subjects who is a Prince of the Blood Royal may, nevertheless, be proposed at one of the Ordinary Meetings of the Society by any Fellow, and may be put to the vote for Election on the same day, provided public notice of such proposition shall have been given by the proposer at the preceding Meeting of the Society.

Any Member of Her Majesty's Privy Council may be proposed at any Ordinary Meeting by means of a certificate prepared in accordance with Statute III of this Chapter, no distinction, however, being made between personal and general knowledge, and the fact of the Candidate being a Member of the Privy Council being alone stated as the qualification. Such certificate, on being allowed by the Society, shall be suspended in some convenient place in the apartments of the Society until the day on which a ballot is taken upon it. The date proposed for the ballot, which shall not be earlier than the third Ordinary Meeting after that at which the certificate is read, shall be announced at the head of the certificate.

V. At the first Ordinary Meeting of the Society in March, the names of all Candidates proposed subsequently to the first Meeting in March of the preceding year, including those whose certificates have been resuspended as hereinafter provided, shall be announced by the Secretary from a list arranged in alphabetical order, without reference to the dates of the certificates of the Candidates; and these certificates shall remain suspended until the day of Election.

VI. In the first week in April, a list shall be printed, containing the names of all the Candidates so announced at the first Meeting in March, arranged in alphabetical order, without reference to the dates of the certificates, together with the names of the Fellows by whom each candidate is proposed and recommended; and a copy of such list shall immediately thereafter be sent to every Ordinary Fellow.

VII. The Council shall select by ballot from such printed list of Candidates a number not exceeding fifteen, to be recommended to the Society for Election; but no such selection by the Council shall be valid unless eleven Members at least be present and vote, a majority deciding, or in the event of equality the President having a second or casting vote.

VIII. At the first Ordinary Meeting of the Society in May, the

President shall read from the Chair the names of the Candidates whom the Council have selected as most eligible, arranged in alphabetical order; and after such Meeting, a circular letter shall forthwith sent to every Fellow, naming the day and hour of Election and inclosing a printed list of the selected Candidates, with space for such alterations as any Fellow may determine to make in pursuance of Statute X of this Chapter.

IX. The election of Ordinary Fellows not included in the privileged classes referred to in Statute IV of this Chapter, shall take place on the first Thursday of June; unless the Council shall alter the day of Election to any other day in the month of June, in which case notice of such alteration shall be given to every Ordinary Fellow.

X. On the day of Election two Scrutators shall be nominated by the President, with the approbation of the Society, to assist the Secretaries in examining the lists; and each Fellow present at the voting, shall deliver to one of the Secretaries or Scrutators on the printed lists mentioned in Statute VIII of this Chapter, having erased the name of any Candidate or Candidates for whom he does not vote, and, if he shall have thought fit, having substituted or added the name of any other Candidate or Candidates contained in the printed list sent in pursuance of Statute VI of this Chapter.

XI. One of the Secretaries shall take down the names of the Fellows who vote, and the Scrutators, after examining the lists with the Secretaries, shall report to the President the names of the Candidates who shall have been duly elected in compliance with the Charter; and the President shall announce those names from the Chair.

XII. Any Candidate announced at the first Ordinary Meeting of the Society in March, as aforesaid, who shall not have been elected, shall, if his proposers, or any one of them, so request in writing, continue a candidate; his name shall be placed in alphabetical order with those of the new Candidates to be announced in March following, and his certificate shall be suspended along with those of the other Candidates. Any additional qualifications of such a Candidate shall be set forth in a supplementary certificate to be signed by not fewer than six Fellows.

XIII. Every person who is elected a Fellow shall appear for admission on or before the fourth Ordinary Meeting of the Society after the day of his Election, or within such further time as shall be granted for some sufficient cause, be granted by the Council; otherwise his election shall be void.

first made the payments required by the Statutes. Immediately after the reading of the Minutes has been concluded, he shall subscribe the Obligation in the Charter-book, and be introduced to the President, who, taking him by the hand, shall say these words: *I do, by the authority and in the name of the Royal Society of London, for improving natural knowledge, admit you a Fellow thereof.*

XV. The Election, the payments made previous to admission, and the admission of every person into the Society, with the time thereof, shall be recorded in the Journal-book.

XVI. No person shall be deemed a Fellow of the Society until he has made the payments required by the Statutes: nor shall he be entitled to vote at any Election or Meeting of the Society until he shall have been admitted in the manner and form above specified.

XVII. Persons may be elected into the Society, under the title of Foreign Members, who are neither natives nor inhabitants of Her Majesty's dominions, and shall be exempted from the operation of Chapters II and III of these Statutes; they shall be selected from among men of the greatest eminence for their scientific discoveries and attainments.

XVIII. The Council shall from time to time, as they shall see fit, put in nomination persons for Election as Foreign Members, not exceeding, with those already elected, the number of fifty.

XIX. A book shall be kept in which Members of the Council may enter the names of those men of science whom they suggest as Foreign Members; each entry shall be signed by the proposer and be accompanied by a short statement of the principal grounds on which the suggestion is made, and shall be valid for three years only.

XX. When vacancies are to be filled up, a list of the persons so entered shall be sent to each Member of the Council, together with notice of the Meeting at which the list will be considered. At the Meeting thus appointed further entries may be made, and the claims of those men of science whose names have been duly entered in the book shall be considered, and a selection of names shall be made, from among which the Council, at a subsequent Meeting to be then appointed, may make nominations to the Society.

XXI. At the second Meeting the selection of the Candidates to be

nominated shall be by ballot; when, if two-thirds of the Members of the Council present be in favour of the nomination of any Candidate, his name shall be proposed at the next Ordinary Meeting of the Society, and shall be put to the vote at the following Ordinary Meeting.

CHAPTER II.

Of the Obligation to be Subscribed.

EVERY person elected a Fellow of the Society shall, before admission, subscribe the Obligation in the following words:—

We who have hereunto subscribed, do hereby promise each for himself that we will endeavour to promote the good of the Royal Society of London, for improving natural knowledge, and to pursue the ends which the same was founded; that we will be present at the Meetings of the Society, as often as conveniently we can, especially at the Anniversary Elections, and upon extraordinary occasions; and that we will observe the Statutes and Orders of the said Society. Provided, that whenever any of us shall signify to the President under his hand, that he desires to withdraw from the Society, he shall be free from this Obligation for the future.

And if any person elected shall refuse to subscribe the said Obligation, the election of that person shall be void.

CHAPTER III.

Of the Payments to be made by the Fellows to the Society.

I. EVERY person elected a Fellow of the Society shall, before admitted, pay the sum of *ten pounds* for admission money, the sum of *four pounds* for the year of his election, and the same sum annually in advance so long as he shall continue a Fellow of the Society. And if any such person shall refuse or fail to pay the said sum, he shall not be admitted, and his Election shall be void: except the said sums be remitted in whole, or in part, by special order of the Council. Provided always that, except in the case of Fellows elected under Statute IV of Chapter I, the admission fee of a Fellow shall be paid out of the Fee Reduction Fund, and shall not be demanded of the Fellow; and that, except in the case of Fellows elected under Statute IV of Chapter I, and Fellows elected before January, 1879, *one pound* of the annual contribution shall be paid out of the Fee Reduction Fund.

II. All who have or may become Fellows of the Society must at any time compound for their annual payments, by paying at once the sum of *sixty pounds*.

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the 25th day of March in each year. Every Fellow of the Society liable to an Annual Payment shall (previously to the 25th day of March in every year) bring or send the same to the Treasurer or the Assistant Secretary. And if any such Fellow, after notice sent by post to his usual address, in May, and again in September, shall fail to pay the same before the first day of October in each year, his name shall be suspended in the public Meeting-room of the Society as being in arrear, and shall continue so suspended until the sum due be paid. And if any such Fellow shall fail to pay his subscription on or before the first day of November in each year, no satisfactory reason having been assigned to the President and Council for such non-payment, he shall cease to be a Fellow of the Society. Provided, nevertheless, that on a solicitation for readmission being addressed to the President and Council by an individual so circumstanced, within the space of one year following St. Andrew's Day, the case of the individual so soliciting shall be stated by the President from the Chair, at one of the Ordinary Meetings of the Society, and the question of his readmission be put to the vote at the next Ordinary Meeting of the Society.

CHAPTER IV.

Of the Death or Recess of any Fellow.

THE Death or Recess of any Fellow of the Society shall be recorded in the Journal-book of the Society, and the names of such persons announced from the Chair, at the Anniversary Meeting for electing the Council and Officers.

CHAPTER V.

Of the Causes and Form of Ejection.

I. If any Fellow of the Society shall contemptuously or contumaciously disobey the Statutes or Orders of the Society or Council; or shall, by speaking, writing, or printing, publicly defame the Society; or advisedly, maliciously, or dishonestly do anything to the damage, detriment, or dishonour thereof, he shall be ejected out of the Society.

II. Whensoever there shall appear to be cause for the ejection of any Fellow out of the Society, the subject shall be laid before the Council; and if a majority of the Council shall, after due deliberation, determine by ballot to propose to the Society the ejection of the said Fellow, the President shall in that case, at some Ordinary Meeting of

the Society, announce from the Chair such determination of Council; and at the Ordinary Meeting next after that at which said announcement has been made, the Society shall proceed determine the question; and on its appearing that two-thirds of Members present have voted for the ejection of the said Fellow, President shall proceed to cancel his name in the Register, and at the same time pronounce him ejected in these words:—

I do, by the authority and in the name of the Royal Society, London, for improving natural knowledge, declare A. B. to now ejected, and no longer a Fellow thereof.

And the ejection of every such person shall be then recorded in Journal-book of the Society; and his name, as ejected, be also read at the next Anniversary Meeting for Elections.

CHAPTER VI.

Of the Election of the Council and Officers.

I. AT the two Ordinary Meetings of the Society next preceded the day of the Anniversary Election, the President shall give notice of the said Election; and declare how much it imports the good of the Society, that such persons may be chosen into the Council, as are most likely to attend the Meetings and business of the Council, of whom there may be made the best choice of a President and other Officers.

II. Every Fellow of the Society whose residence is known, shall have notice of the Anniversary Meeting for electing the Council and Officers for the year ensuing, by particular summons, which summons shall be sent to the place of residence of such Fellow, a week at least before the day of Meeting, and shall be to this effect:—

These are to give notice, that on the day of the Council and Officers of the ROYAL SOCIETY are to be elected for the year ensuing; at which Election your presence is expected at of the clock in the precisely.

III. The Council for the ensuing year, out of which shall be chosen the President, Treasurer, Principal Secretaries, and Foreign Secretaries shall consist of eleven Members of the existing Council, and of ten Fellows who are not Members of the existing Council.

IV. The President and Council shall, previous to the Anniversary Meeting, nominate, by ballot, eleven Members of the existing Council, and also ten Fellows, not Members of the existing Council, who shall be eligible for Election into the Council.

they recommend to the Society for election to the offices of President, Treasurer, Principal Secretaries, and Foreign Secretary for the ensuing year.

V. At the Ordinary Meeting of the Society preceding the Anniversary Meeting, the names of such persons so recommended for election as Council and Officers for the ensuing year shall be announced from the Chair.

VI. Lists, with the names of the Fellows recommended by the President and Council, and having a blank column opposite for such alterations as any Fellow may wish to make, shall be prepared for the use of the Fellows, one week before the day of Election.

VII. Two Scrutators shall be nominated by the President, with the approbation of the Society, to assist the Secretaries in examining the lists.

VIII. Each Fellow voting, shall deliver his list to one of the Secretaries or Scrutators; and the name of each Fellow who shall so deliver in his list shall be noted by one of the Secretaries.

IX. The Scrutators, after examining the lists with the Secretaries, shall report to the Society the names of those having the majority of votes for composing the Council, and filling the offices of President, Treasurer, Principal Secretaries, and Foreign Secretary; the names of which persons shall then be announced from the Chair.

X. For electing any Member of the Council, or any Officer to be elected by the Society, upon such vacancies as shall happen in the intervals of the Anniversary Elections, the summons for such Election, and the proceedings in it, shall be after the same manner as is directed for the Anniversary Election.

XI. Upon any vacancy of the President's place, occurring in the intervals of the Anniversary Elections, the Treasurer, or, in his absence, one of the Secretaries, shall cause the Council to be summoned for the Election of a new President: and the Council meeting thereupon in the usual place, or any eleven or more of them, shall proceed to the said Election, and not separate until the major part of them shall have agreed upon a new President.

CHAPTER VII.

Of the President.

I. THE business of the President shall be to preside at all meetings, and regulate all the debates, of the Society, Council, and Committees; to state and put questions both in the affirmative and negative, according to the sense and intention of the meetings; to call for reports and accounts from Committees, and others; to check irregularities, and to keep all persons to order; to summon Meetings of the Council, and Committee of Papers; and to execute or see to the execution of, the Statutes of the Society.

II. The President shall take precedence of every Fellow of the Society, at their ordinary place of meeting; and also in all other places, where any number of the Fellows meet as a Society, Council, or Committee.

III. In the absence of the President, one of the Vice-Presidents shall act as his deputy, and may do, in the absence of the President, the same acts as the President himself could do if present.

CHAPTER VIII.

Of the Treasurer and his Accounts.

I. THE Treasurer, or some person appointed by him, shall receive for the use of the Society, all sums of money due or payable to the Society; and shall pay and disburse all sums due from or payable by the Society; and shall keep particular Accounts of all such receipts and payments.

II. Every sum of money payable on account of the Society, exceeding Ten Pounds, shall be paid only by order of the Council; but payments for rates or taxes, to any amount, may be made to the Treasurer, without any specific order of the Council for that purpose.

III. All sums of money, which there shall not be present occasion for expending, or otherwise disposing of to the use of the Society, shall be laid out in such Government or other securities as shall be approved of and directed by the Council.

IV. The Treasurer shall keep a yearly account of all such Fellowships of the Society as pay the sum appointed as the composition in lieu of annual payments; and also of those who make the annual payment, and in this account shall be noted the times up to which the annual payments have been made, and the arrears due from each Fellow.

the sum paid, and the time for which payment is made; the Receipts to be signed by the Treasurer, or by the Assistant Secretary receiving the money on the Treasurer's behalf, who, upon the delivery of the Receipt to the Fellow paying, is to enter upon that part of the Cheque which is left in the Book, the above particulars, and also the day of payment.

VI. The Treasurer shall demand, or cause to be demanded, all arrears of annual payments, as soon as convenient after the first day of May.

VII. The Accounts of the Treasurer shall be audited annually, at a short time preceding the Anniversary Elections, by a Committee consisting of three Members of the Council, of whom the President or one of the Secretaries to be one; and of three Fellows of the Society not Members of the Council, who are to be nominated by the President, with the consent of the major part of the Fellows present, given by ballot at one of the three next preceding weekly meetings; any one or more of the said three Members of the Council, together with any one or more of the said three Fellows, shall be a Quorum of the said Committee: the Members of the said Committee who are of the Council shall make their Report to the Council held next after such audit, on or before the Anniversary Election; and the Members of the said Committee who are not of the Council shall make their Report to the Society, upon the Meeting next before the Anniversary Election, or on the day of the said Election.

VIII. The Treasurer shall have the charge of the Title Deeds of the Society's Estates, the Policies of Insurance, and Securities.

IX. As soon after the Audit as may be, and before the Anniversary Meeting, the Treasurer shall cause an abstract of the Society's Accounts of the preceding year to be printed for the use of the Fellows.

CHAPTER IX.

Of the Secretaries.

I. THE Secretaries, or one of them, shall have inspection over the Assistant Secretary; and shall give the Orders and Directions concerning the entering and writing of all minutes or matters in the Journal-books of the Society or Council, or any other Books of the Society; and also concerning any orders or other writings for the use and service of the Society.

II. The Secretaries, or one of them, shall attend all meetings of the Society, Council, and Committee of Papers; where, when the President has taken the Chair, one of the Secretaries shall read the minutes, orders, and entries of the preceding meeting; and shall afterwards take minutes of the business and orders of the present meeting, to be entered by the Assistant Secretary in the respective books to which they relate.

III. At the meetings of the Society, Lists of the Presents made from time to time to the Society shall be laid on the Table, by one of the Secretaries, for the inspection of the Fellows; and the thanks of the Society to the Donors shall be proposed from the Chair previously to the reading of the first Paper. One of the Secretaries shall give notice of any Candidate who stands proposed for election into the Society at that Meeting; and the Secretaries shall receive Letters and Papers presented to the Society, in such manner as the President shall direct.

IV. The Secretaries shall draw up all letters to be written to any persons in the name of the Society or Council (to be read and approved of in some meeting of either respectively), except, for some particular cause or consideration, some other person be appointed by the Society or Council to draw up any such letter. They shall likewise have the charge (under the direction of the Committee of Papers) of printing the *Philosophical Transactions*, the *Proceedings*, and other Publications of the Society.

V. The letters relating to the business of the Society, received during each Session, shall be arranged and kept in the apartments of the Society.

VI. The duty of the Secretary for Foreign Correspondence shall be to receive and answer all letters from foreign parts relating to the business of the Society, to return thanks for Presents from Foreigners made to the Society, and to forward to persons elected Foreign Members the Diplomas certifying their election into the Society.

CHAPTER X.

Of the Assistant Secretary.

I. THE person who shall be chosen to the office of Assistant Secretary, shall either not be a Fellow of the Society; or, if a Fellow, shall cease to be so upon his election to and acceptance of the office.

give security, at the discretion of the Council; and he shall reside in the Society's House.

III. The Assistant Secretary shall be paid for his services according to the determination of the Council; and shall not, besides such payments, receive any perquisite or profit whatsoever without the express permission of the President and Council. He shall be subject to such Rules and Orders as shall from time to time be made or given by the President and Council; and he shall constantly be in attendance during all meetings of the Society, Council, and Committees.

IV. He shall enter all the Minutes in the several Journal-books, and make an Index to every such book: he shall lay before every Council their fair Minute-book: and before every Committee of Papers, the Society's Journal-book, to show that the several entries are fairly made: and he shall have the care of the writing of all Summonses of the Society, Council, and Committees.

V. He shall, under the direction of the Secretaries, have the charge and custody of the Charter-book, Statute-book, Journal-books of the Society and Council, Register-books, and Letter-books, as also of all Papers and Writings belonging to the Society; all which shall be kept in the House of the Society, that they may be in readiness to be produced at any meetings of the Society or Council, as the case may require, or as shall be ordered by the Society, Council or President.

VI. He shall not suffer any person, not being a Fellow of the Society, to read any Journal-book, Record, or Writing, or any part thereof, belonging to the Society; nor give any copy thereof, nor in any way communicate anything contained therein, to any such person.

VII. He shall follow the directions which may be given him from time to time by the Treasurer in respect of that part of his duties which relates to the Accounts or Cash Transactions of the Society. He shall enter in a book, to be provided by the Treasurer, all such sums as he may receive on account of the Society at the instant of receiving such sums; and for these sums, so entered by him, he shall be answerable, until he shall have paid them to the Treasurer.

VIII. He shall attend the Library at such hours as shall be appointed for him for the accommodation of such Fellows of the Society

as shall come to read the printed books or manuscripts, and of a other person who shall be introduced by a Fellow, either personally or by letter.

IX. He shall mark with the stamp of the Society all books accepted or bought by the Society.

CHAPTER XI.

Of the Meetings of the Society.

I. THE Session of the Society shall commence on the third Thursday in November, and end on the third Thursday in June.

II. The Ordinary Meetings of the Society shall be on Thursdays weekly (excepting Christmas, Passion, Easter, and Whitsun weeks and such other weeks at Christmas and Easter, in each year, as the Council may in the preceding year determine, and also Ascension Day), and shall begin at half-past Four o'clock in the Afternoon precisely.

III. No stranger shall be permitted to be present during the Meeting, unless by invitation of the President, or by his leave or order upon the recommendation of some Fellow.

IV. The business of the Society in their Ordinary Meetings shall be to order, take account, consider, and discourse of philosophical experiments and observations; to read, hear, and discourse upon letters, reports, and other papers containing philosophical matters as also to view, and discourse upon, rarities of nature and art: and thereupon to consider, what may be deduced from them, or any of them; and how far they, or any of them, may be improved for use or discovery.*

V. No letter, report, or other paper shall be read at any Ordinary Meeting unless it be communicated by a Fellow or Foreign Member and it shall be the duty of each Fellow or Foreign Member to satisfy himself that any letter, report, or other paper which he may communicate, is suitable to be read before the Society.

VI. The conduct of the Ordinary Meetings shall be in accordance with the Standing Orders determined from time to time by the President and Council, provided always that at the Ordinary Meeting nothing relating to Statutes or management of the Society shall be brought forward or discussed.

* This is the wording of the Statute as given in the Statutes of 1663.

CHAPTER XII.

Of Special General Meetings of the Society.

I. THE President or Council may at any time call a Special General Meeting of the Society when it may appear to them to be necessary.

II. Any six Fellows may, by notice in writing, signed by them, and delivered to one of the Secretaries at an Ordinary Meeting of the Society, require a Special General Meeting of the Society to be convened, for the purpose of considering and determining on the matters specified in such requisition, and the Council shall, within one week after such requisition shall have been so delivered, appoint a day for a Special General Meeting accordingly.

III. One week's notice of any Special General Meeting shall be given to each Fellow resident in the United Kingdom, and such notice shall state the object of such Meeting.

IV. At such Meeting no business shall be brought forward except what shall have been so notified.

CHAPTER XIII.

Of the Publication of Papers.

I. THE Members of the Council for the time being shall constitute and be a standing Committee, to be called the Committee of Papers, to whom the consideration of the acceptance, reading, and publication of all papers communicated to the Society shall be referred, and who shall execute their powers in accordance with Standing Orders determined from time to time by the President and Council.

II. The Committee of Papers shall meet at such times as shall be appointed by the President; due and sufficient notice of such meeting having been previously sent to every Member of the Committee.

The publication of papers communicated to the Society, and of such other matters as the President and Council may judge fit to publish, shall take place under Standing Orders determined from time to time by the President and Council, but always in such a way that a proper portion of them shall from time to time be printed and published under the title of the 'Philosophical Transactions of the

title of the 'Proceedings of the Royal Society of London,' provided always that the President and Council shall have power to publish either papers or other matter in such form and under such conditions as they may from time to time determine.

III. At a meeting of the said Committee no less number than seven of the Members (of which number the President, or, in his absence, a Vice-President, shall always be one) shall be a quorum.

IV. The decisions of the Committee of Papers shall be determined by the majority of votes of those present and voting, and the voting shall be open, unless the President shall direct that the voting shall be by ballot. In case of an equality of votes, the President shall have a second or casting vote.

The decisions of the Committee shall be duly entered in the Minutes book of the Committee.

V. The *Philosophical Transactions* and the *Proceedings* shall be printed at the sole charge, and for the use and benefit, of the Society and of the Fellows thereof; to the intent that each of the present Fellows, who actually contributes and pays towards the support of the Society, or who has compounded for such contribution, according to the rules and orders established in relation thereto, or who has for other particular reasons been exonerated and discharged from such contribution by order of the Council, may receive *gratis* (but under proper limitations and restrictions) one copy of such of the *Philosophical Transactions* and of the *Proceedings* as shall be printed as aforesaid; and that all persons who shall hereafter be admitted Fellows shall, under the same conditions, receive, and be entitled to the like benefit and advantage.

VI. The Assistant Secretary shall deliver *gratis* one of the said copies of the *Transactions* to every Fellow of the Society (except as hereinafter excepted) who shall demand the same, either in person or by letter.

Provided always, that no Fellow whatsoever of the Society shall be entitled to demand or receive any such copy of the *Transactions* whose election and payment of Admission fees and regular Contributions shall not have preceded the date of the time appointed for the delivery of the said *Transactions*; neither shall the Executor of an deceased Fellow receive a copy of the *Transactions* published after the death of such Fellow.

Provided also, that no Fellow of the Society shall receive, or be entitled to receive, *gratis*, any copy or copies of the *Transactions*, s

respectively; but his neglecting to demand them for so long a time shall be deemed a forfeiture and dereliction of his right thereto: unless the Council for the time being, upon being made acquainted with the reason of such delay, and having regard to the circumstances of the application, and the amount of stock in hand, shall order such copies as they may think fit to be so delivered.

VII. The Assistant Secretary shall further cause to be distributed *gratis* to all the Fellows of the Society, by post or otherwise, copies of the *Proceedings* as soon as may be convenient after their appearance.

VIII. If the number of copies of *Transactions* and *Proceedings* so to be printed shall be greater than what will be requisite to supply each of the Fellows with one copy, such supernumerary copies shall be disposed of at such times, and in such manner, as the Council shall direct.

CHAPTER XIV.

Of the Books and Papers of the Society.

I. THERE shall be had and kept a Book, called the *Charter-book*, wherein shall be fairly written the copy of the Charters, all the Royal Grants on the behalf of the Society, and the Obligation to be subscribed by the Fellows of the Society in their own hand-writing.

II. There shall be kept a Book, called the *Statute-book*, wherein shall be fairly written, or printed, all the Laws, Statutes, and Constitutions made, or to be made, concerning the government and regulating of the Society or Council; and also a Register of the Fellows of the Society, with the times of their Election and Admission.

III. There shall be kept *Journal-books** of the Society, and also of the Council, wherein shall be entered all the minutes, orders, and business of the Society and Council at their respective meetings; to which *Journal-books* any Fellow may have access at such times as the Library is open.

IV. A Book shall be kept, in which the title of each communication received, the date of its reception at the apartments of the

* "The words '*Journal-books*' do not include the *Minute-books* of the Government Grant Committee or those of the Government Grant Boards."—*Minute of Council*, May 24, 1894.

Society, and the name of the Fellow or Foreign member who communicates it, shall be duly entered in the order of its reception.

V. The original copy of every Paper received at the Society shall be considered the property of the Society, if there be no previous engagement with its author to the contrary; but any author may withdraw a paper which has been received but not read; or may, by leave of the Council, have a copy of his paper; and it shall be in the power of the Council, if they think fit, to return to the author such drawings or other illustrations accompanying any paper communicated by him or on his behalf, which he may ask to be returned to him.

VI. All the Papers not withdrawn by leave of the Council, read at the Society, shall be delivered to the Committee of Papers, and all Papers which have not been printed in the *Transactions and Proceedings* shall be preserved in the archives of the Society for future inspection; and shall never be lent out of the Society House without Order of the Council.

VII. The Library shall be open to the Fellows every week (exclusive of Good Friday and Easter-eve, of Easter week, of a week at Whitsuntide, and of a week at Christmas), from 11 a.m. to 6 p.m., except on Saturdays, when it shall be open from Eleven the morning to One in the afternoon; but during the months of August and September it shall be closed on week-days, other than Saturdays, at 4 p.m.

VIII. Any Fellow may have the loan of any of the printed Books of the Society, excepting such as the Council shall order not to be taken out of the Library; but he shall not be allowed to have in his possession more than ten volumes at a time. The loan of Manuscripts is exclusively vested in the President and Council.

IX. A List of all Books and Manuscripts borrowed from the Library of the Royal Society, and of the Fellows of the Society, whom they are lent, shall be kept in the Library.

X. All Books whatsoever belonging to the Society shall be turned at a time to be specified by the Council, in each year; and the Library shall be closed for one month after such time, or for such shorter periods as the Council may direct.

XI. The value of such Books in the possession of any Fellow who are not returned to the Library pursuant to the preceding Statutes shall be required to be paid by the person who has so detained the

I. THE Common Seal of the Society shall be kept in a box, the key of which shall be kept in a sealed packet. When the Common Seal has to be used, this packet shall be opened by the President in Council; and at the Council meeting at which it is so opened, the Common Seal having been replaced in the box, and the box locked, the key shall again be enclosed in a packet, which shall be sealed by the President with his private seal. The box and sealed packet shall be kept at the Society's chambers in an iron safe.

II. Every Deed or writing, to which the Common Seal is to be affixed, shall be passed and sealed in Council.

CHAPTER XVI.

Of the Restraint of Dividends to Fellows.

THE Society shall not, and by its laws may not, make any Dividend, Gift, Division, or Bonus in Money unto or between any of its Members.

CHAPTER XVII.

Of the Making and Repealing of Laws.

I. FOR the making of any Law or Statute of the Royal Society, the draught thereof shall be read in Council, and put to the vote, on two several days of their meeting. The first day the question to be resolved by vote shall be to this effect, viz., "Whether the draught of the said Statute, then agreed upon, shall be read at another meeting?" The second day the question shall be to this effect, viz., "Whether the draught of the said Statute, then agreed upon, shall pass for a Law, or not?"

II. For the repealing of any Law or Statute, or any part thereof, the Repeal shall be proposed and voted in Council on two several days of their meeting. The first day the question to be resolved by Ballot shall be to this effect, viz., "Whether the Repeal of such a Statute, or such part thereof, shall be proposed at another meeting?" The second day the question shall be to this effect, viz., "Whether such a Statute, or such part thereof, shall be repealed, or not?" And in case the said Repeal be agreed unto, the same

shall be recorded in the Journal-book of the Council; and the Statute, or part of the Statute, repealed, shall be cancelled in the Statute-book.

January 1, 1897.

STANDING ORDERS OF COUNCIL RELATING TO MEETINGS, SECTIONAL COMMITTEES, AND PUBLICATIONS

(As amended Feb. 16th, 1899.)

NOTE.

By Statute XIII, 1, the consideration of the acceptance, reading and publication of all papers communicated to the Society is referred to the Council sitting as Committee of Papers; and in the following Standing Orders the word "Council," when used in connection with the acceptance, reading, or publication of papers, is to be understood to mean the Council sitting as Committee of Papers.

I.

Relating to the Conduct of Ordinary Meetings.

1. At each Ordinary Meeting, any formal business of the Society which may be necessary, such as the reading of certificates, balloting for candidates under Cap. I, Sec. IV, announcements, returning thanks for presents, &c., shall, unless the President direct otherwise, be the first business of the meeting.

2. At each Ordinary Meeting, not being "a Meeting for Discussion," as hereinafter provided, or for the Bakerian or the Croonian Lecture, the President shall determine what papers are to be read and the order in which they shall be taken. He may also, whenever he sees fit, direct the author of a paper or one of the Secretaries to read an abstract of the paper or the paper itself, if it be sufficiently brief, or may invite the author to make an oral statement of the nature of its contents, and may also invite remarks upon the paper. When an oral statement is desired, the author shall, so far as possible, be previously informed of the fact. A paper shall be considered to have been "read" if one of the Secretaries has read its title only.

and at such period of the Meeting as the President may determine, make a communication not of the nature of a "paper," or exhibit objects having relation to the advancement of Natural Knowledge.

4. The President shall further have power at any Ordinary Meeting, and at any period of that Meeting which he may think proper, to make such announcements or statements, as he may think desirable, relating to the advancement of Natural Knowledge.

5. In each year certain Ordinary Meetings, not more than four in number (exclusive of the Meetings set aside for the Bakerian and Croonian Lectures respectively), shall be devoted each to the hearing and consideration of some one important communication, or to the discussion of some important topic; these Meetings shall be termed "Meetings for Discussion."

6. The Council shall from time to time give due notice of the dates at which Meetings for Discussion will be held.

7. The Council, of its own motion, or upon the recommendation of a Sectional Committee, may select some communication made to the Society in the ordinary way, as the subject for such a Meeting for Discussion, or it may select for that purpose some question, the discussion of which would, in their judgment, be likely to advance Natural Knowledge. In the latter case, the Council shall appoint some person to open the discussion by means of a communication made by him for that purpose.

8. When a Meeting for Discussion has been arranged, the Council, or the Officers, shall direct printed copies of the communication which has been approved of for the said Meeting (or of an adequate abstract of it), to be sent not later than one week before the date of the Meeting, to each Fellow, or to certain Fellows of the Society, and to such other persons as the President may direct. And the Council shall take such other steps as may seem to it desirable to render the discussion useful towards the advancement of Natural Knowledge.

9. At each Meeting for Discussion, the conduct of the discussion shall be under the direction of the President, who shall arrange for the Fellows present and desiring to speak, and who shall have the power to invite, if he think fit, persons present, not Fellows of the Society, to take part in the discussion. Any Fellow shall be at liberty to send to the Secretaries, previous to the Meeting, written remarks on the communication which is the subject of the meeting, and the President shall, if he see fit, direct one or other of the Secretaries to read these remarks at the meeting.

Relating to Sectional Committees.

10. The Council shall appoint, from among the Fellows of the Society, Committees representing the several branches of Natural Knowledge, and called "Sectional Committees." The Members of each Committee shall be chosen with a view to secure, so far as is possible, a representation of the several sub-divisions of each branch of Natural Knowledge, and to obtain the assistance of Fellows who, from their connection with other societies, and otherwise, are specially qualified to advise the Council in respect to particular parts of Natural Knowledge.

11. It shall be the business of each Sectional Committee to advise the Council (whether sitting as the Committee of Papers or otherwise) or the Officers upon matters referred to it by the Council or by the Officers, and otherwise to make to the Council such suggestions as it may think desirable touching the branch or branches of Natural Knowledge which it represents, it being understood that no Sectional Committee shall offer advice to the Council as to the selection of candidates for admission into the Society as Fellows or Foreign Members, or as to the awards of Medals, unless the Council shall have asked for such advice.

12. The Council shall each year appoint a Member of each Committee to serve as Chairman of that Committee, and to be the channel of communication between the Committee and the Council or Officers.*

13. The Sectional Committees shall be six in number, viz. :—

- (1) A "Mathematics" Committee for Mathematics, Mathematical Physics, Crystallography, and Mathematical Astronomy.
- (2) A "Physics and Chemistry" Committee for Experimental Physics, Observational Astronomy, Meteorology, Chemistry, and Metallurgy.
- (3) A "Geology" Committee for Geology, Palæontology, Mineralogy, and Geography.
- (4) A "Botany" Committee for Botany.
- (5) A "Zoology" Committee for Zoology and Comparative Anatomy.
- (6) A "Physiology" Committee for (Animal) Physiology and Medical Subjects.

14. The "Mathematics" Committee shall consist of six Members of whom two shall retire each year; three Members shall form quorum.

form a quorum.

The "Geology" Committee shall consist of nine Members, of whom three shall retire each year; four Members shall form a quorum.

The "Botany" Committee shall consist of nine Members, of whom three shall retire each year; four members shall form a quorum.

The "Zoology" Committee shall consist of nine Members, of whom three shall retire each year; four members shall form a quorum.

The "Physiology" Committee shall consist of twelve Members of whom four shall retire each year; five members shall form a quorum.

15. Any Member of Council who desires to attend the meetings of any Sectional Committee, of which he is not at the time being a Member, shall have power to do so as *amicus curiæ* under the following conditions. Upon his expressing in writing to the Assistant Secretary his wish so to attend, the summons for each meeting of the Committee shall be sent to him as to an ordinary Member of the Committee during his tenure of office as Member of Council, or during such shorter time as he may name; but the Chairman of the Committee shall not be expected to correspond with him as with an ordinary Member of Committee. He may with the consent of the Chairman speak during the deliberations of the Committee, but shall give no vote.

16. It shall be in the power of the Council to add to the number of any Committee, if at any time it may seem to be desirable to do so.

(The following Standing Orders, 17—28, are the same for each Sectional Committee.)

17. The retirement of Members shall be determined by seniority.

18. The retiring Members of the Committee shall each year vacate office on the 31st of December, and shall not be eligible for election for the ensuing year.

19. Should, by reason of death or otherwise, a vacancy occur at any intermediate time, the Council shall appoint a person to fill the vacancy, and the retirement of the person so appointed shall be according to the rules which would have applied to the Member whose place he fills, provided that, if at the date of retirement the said person has not served more than one year, he shall be eligible for immediate re-appointment.

20. The appointment of the Fellows to serve as new Members of Committee shall be made by the Council in December, and the

Members so appointed shall enter office upon the 1st of January ensuing.

21. The Committee shall, when necessary, meet in the apartment of the Society at some convenient hour on the second Thursday in each month from October to July, both included, or at such other times and places as the Chairman may determine.

22. The summonses for a meeting shall be issued by the Assistant Secretary at the direction of the Chairman.

23. The decisions arrived at by a meeting of a Committee at which the Members present do not form a quorum shall be valid, if subsequently agreed to in writing by not less than two-thirds of the whole Committee.

24. Voting shall be open, unless any Member of the Committee shall demand the ballot. The Chairman shall have a second or casting vote.

25. The Minutes of the Committee shall be duly recorded in a book kept for that purpose, and preserved in the apartments of the Society, or in the custody of the Chairman, together with such correspondence and documents relating to the business of the Committee as the Committee may think it desirable to preserve.

26. The Committee shall make to the Council, through its Chairman who shall be provided by the Society with such clerky assistance as he may need, reports to the Council, answers to inquiries of the Council, and such suggestions as the Committee may think desirable. The minutes of the Committee shall be laid before the Council whenever the Council shall so demand.

27. When a Committee is of opinion that a paper referred to it might profitably serve as the basis of a discussion at a meeting of the Society, it shall forthwith report to that effect to the Council. If the matter seem urgent, the President and Officers shall have power without waiting for a Meeting of the Council, to take immediate steps towards carrying out the recommendations of the Committee.

28. Should, at any time, a Committee be of opinion that it would be desirable to encourage a discussion at a meeting of the Society upon some subject, concerning which no paper suitable to serve as basis for discussion is under its consideration, and have ascertained that some person is willing to prepare a suitable paper for that purpose, the Committee, having approved of the said paper, shall recommend it to the Council, to be treated as the basis of a discussion to be held at some convenient meeting.

III.

other purposes relating to papers received, and shall report the reception to the one or the other of the two Secretaries, according to the nature of the communication.

30. The Secretary to whom the paper is thus reported shall, if he sees fit, of himself, or after consultation with the other Officers or with the Chairman of the appropriate Sectional Committee, direct the paper to be marked as "accepted for consideration," otherwise he shall refer the question of acceptance for consideration to the appropriate Chairman of Sectional Committee, who shall at a meeting of his Committee, or by correspondence with its Members, obtain the view of the Committee thereupon, and report the same to the Secretary, who shall act on the advice so given.

31. In the case of a paper not being accepted for consideration, the Fellow communicating the paper shall be informed thereof, but the paper itself shall remain the property of the Society, provided always that such Fellow may, with the consent of the Council, withdraw the said paper, upon the understanding expressed in writing that the paper is to be regarded as not having been communicated to the Society at all.

As to the 'Proceedings.'

32. In the case of a paper being accepted for consideration, the author shall be required to furnish, if he has not already done so, a short account of the main points of the paper, hereinafter called an "abstract," of such length and nature as shall be approved of by the Secretaries; provided that if the paper do not exceed in length about twelve pages of the 'Proceedings' (such a paper being hereinafter called a "short" paper), an abstract of it shall not be required.

33. In the case of a paper accepted for consideration, and of which when required an abstract has been furnished, the Secretaries shall proceed to make arrangements for the reading of the paper, and shall, if they think fit, of themselves, or after consultation with the Chairman of the appropriate Sectional Committee, mark the abstract or short paper as suitable for publication in the 'Proceedings'; otherwise they shall refer the question of publication of the abstract, or in the case of a short paper, of the paper itself, to the Chairman of the appropriate Sectional Committee, who shall, either at a meeting of the Committee, or by correspondence with its Members, obtain the view of the Committee thereupon, and report the same to the Secretaries, who shall act upon the advice so given.

34. In all cases where the Secretaries have, as regards the acceptance or reading of any paper, or the publication of any abstract or

paper, acted under Standing Order 30, or 33, of themselves, or after consultation with a Chairman of Committee only, the Committee itself not having been formally consulted in the matter, such action shall be reported to the Committee.

35. When a paper has been accepted for consideration, and appointed to be read, the author shall be informed of the meeting at which it is appointed to be read, and shall be supplied with a copy of Standing Order 2. In cases where the President or Secretaries, after consultation (if they see fit) with the appropriate Sectional Committee or its Chairman, are of opinion that at the meeting the author of the paper should be invited to make an oral statement, or that the abstract (or short paper) prepared for publication in the 'Proceedings' should be read, the author shall be informed of the fact, and be invited to be present.

36. Abstracts of papers, or short papers in full, which have been marked as suitable for publication in the 'Proceedings,' shall be set up in type without delay, and proofs submitted to authors for correction.

37. The 'Proceedings' of the Royal Society shall be published in numbers which shall be issued at as short intervals as may be found suitable, and shall contain :—

- i. In reference to each meeting, a record of the formal business conducted at the meeting, the titles of the papers read at the meeting, and such an account of other communications made at the meeting or of other proceedings, not of the nature of business or of discussions on the papers read, as the President and Officers may judge it desirable to insert.
- ii. Such abstracts of papers or such short papers ordered for publication in the 'Proceedings,' as may be ready to be published.
- iii. Such papers, not of the nature of short papers, or such other matter as the Council may, in special cases, order to be published in the 'Proceedings.'

38. The Secretaries shall take what means they may think proper to secure that the account given in the 'Proceedings' of any communication made at a meeting besides the papers read, or of anything which occurred and seemed worthy of being recorded, shall be accurate; and if, from anything which takes place at a meeting, they should have reason to think that the Sectional Committee might wish, in respect to any paper, to reconsider the recommendation that it should be published, they shall have power to postpone the publication of that abstract or paper, and refer the abstract or paper once more to the Sectional Committee.

39. The account given in the 'Proceedings' of a "Meeting :
Discussion" shall be printed in the 'Proceedings' of the following

(Standing Order 3) as the respective authors may desire to see so published, provided always that all such communications are subject to the General Standing Orders relating to the publication of papers in the 'Proceedings.' There shall be no report of the discussion itself.

As to the 'Philosophical Transactions.'

40. Every paper communicated to the Society, and accepted for consideration, shall be referred by the Secretaries to the appropriate Sectional Committee through the Chairman of that Committee, provided always that, for the better expedition of the business of the Society, the Secretaries, as provided above (Standing Orders 33 and 36), shall have power, in the case of short papers, to proceed with the reading and publication of a paper previous to its having been considered by a Committee. If the said Chairman is of opinion that the subject of the paper does not lie within the scope of his Committee, he shall report the same to the Secretaries, who shall refer the paper to some other Sectional Committee. Should the Secretaries be of opinion that a paper pertains by its subject to more than one Sectional Committee, they shall take steps in order that the judgment of the several Committees concerned may be obtained. In the case of any difficulty as to the reference of a paper to its appropriate Sectional Committee or Committees, the Secretaries shall bring the matter before the Council.

41. The Chairman through whom the paper is referred shall bring the paper under the consideration of his Committee at the next regular meeting of the Committee, or at some earlier meeting which he may think it desirable to call, having in the meanwhile, if he and one or other of the Secretaries judge it desirable, submitted the paper to one or more Members of the Committee, or Fellows of the Society not Members of the Committee, whose opinion or opinions he shall report to the Committee.

The Sectional Committee, for its guidance in judging a paper so brought before it, shall obtain from at least two persons—who are knowing and well skilled in the particular branch of Natural Knowledge to which the said paper relates, and who may or may not be Members of the Committee, but, unless there be special reasons to the contrary, must be Fellows of the Society—acting as referees, opinions in writing upon the following points, viz. :—

- i. Whether the paper should or should not be published in the 'Philosophical Transactions' ;
- ii. Whether, in the former case, it should be published in full or in part only, the part so to be published being indicated ;

so, of what nature;

- iv. Which illustrations (if any) accompanying the paper should be reproduced.

Having obtained and considered such written opinions, and having if it see fit, consulted another Sectional Committee or others of the Sectional Committees, and having at a meeting (in accordance with Standing Orders 23, 24) decided upon the above points, it shall embody its decisions, together with any other recommendations which it may think fit to make in reference to the paper, in a Report to the Council, signed by the Chairman, to which Report shall be appended for inspection by the Council, the written opinions of the Referees.

42. The Sectional Committee, in thus deciding upon a paper, shall be guided by the principle that such a paper only should be recommended for the 'Philosophical Transactions' as appears to mark a distinct step in the advancement of Natural Knowledge.

43. If the Council approves of the Report of the Sectional Committee, the Secretaries shall immediately take action with regard to the publication of the paper, in accordance with the Report. If the Council does not approve of the report of the Sectional Committee, it shall request the Sectional Committee to reconsider its recommendations, and shall not come to a decision until it has received the further report of the Sectional Committee. But, for the better expedition of the business of the Society, the Secretaries, in such cases as they judge fit, shall have power to take steps with regard to the publication of a paper in the 'Philosophical Transactions,' in accordance with the decision of a Sectional Committee, previous to that decision having been brought before the Council; and they shall also have power, in cases in which they and the Chairman and the appropriate Sectional Committee agree in thinking it desirable to take such steps as they may think fit with regard to the publication of a paper in the 'Philosophical Transactions,' previous to a formal decision of the said Committee upon the paper having been taken.

44. In the case of the Chairman of a Sectional Committee being the author of a paper referred to that Committee, the Secretaries shall have power, in consultation with some member or members of the Committee, other than the Chairman, to take the same action as under the foregoing standing orders they are empowered to take in consultation with the Chairman.

45. Each paper ordered for publication in the 'Philosophical Transactions' by the Council shall be published separately in paper covers, the date at which it is issued being marked on the cover, and shall be sold separately.

46. The several papers shall also be issued bound in two series.

inter-val, so far as possible regular, and of not too great a length; no paper being kept back more than six months from the date of its publication as a separate paper.

47. In the case of communications received in the Christmas, the Easter, or the Midsummer recess, the Secretaries shall have power, with the approval of the Chairman or Chairmen of the appropriate Sectional Committee or Committees, to issue a number or numbers of the 'Proceedings' containing such communications, without waiting for their being read at a meeting of the Society.

48. When the Council or the Society has appointed a person, or two or more persons acting as Committee, to carry out a particular inquiry, and the person or Committee has presented a report giving an account of such inquiry, the Council, having consulted the appropriate Sectional Committee or Committees in the usual way as in the case of a paper presented, shall direct the report, if deemed worthy of publication, to be published either in the 'Proceedings,' as a separate number if this should seem convenient, or in the 'Transactions,' according as the one or the other may seem the more suitable for the purpose.

49. A Year-book of the Society shall be published annually, so soon after the Anniversary Meeting as shall be convenient.

IV.

RELATING TO THE COMMITTEE OF PAPERS.

50. The Minutes of the Council sitting as Committee of Papers shall be kept separately from the ordinary Minutes of Council.

51. At each meeting of the Committee, the Secretary shall lay before the Committee a statement of the papers under consideration, showing briefly in the case of each paper the action which has been taken in regard to it, and the recommendations which may have been made concerning it by a Sectional Committee, together with, in the case of a paper recommended for publication in the 'Philosophical Transactions,' an approximate estimate of the cost of publication. Such a statement, or so much of it as is possible, shall be printed and distributed to the Members of the Committee previous to the meeting.

52. At each Meeting of the Committee the written decisions of the Sectional Committees, and the reports of referees, which may have been made in respect to papers mentioned in the Statement, shall be laid upon the table.

53. The Committee may, if it see fit, adopt *en bloc* all the recommendations contained in a Statement, provided always that if any Member of the Committee, either personally or, if absent, by writing,

object to any particular recommendation or recommendations, such recommendation or recommendations shall be considered separately, the remainder being treated *en bloc*.

54. The decisions of the Committee on all questions before it shall be by the majority of those present and voting, the voting being open unless any member demand a ballot, in which case the voting shall be by ballot.

EXPLANATORY NOTES ON THE PROCEDURE RELATIVE TO THE READING AND PUBLICATION OF PAPERS.

1. No paper is received by the Society unless it be communicated by a Fellow. A Fellow, in communicating a paper, is required by Statute to ascertain that the paper is a fit and proper one to be communicated; he should satisfy himself not only that the paper is by its nature so fit, but also that it has not previously been published elsewhere.

A Fellow, in communicating a paper, should state whether he (the author) desires that it should be published in the 'Proceedings' or in the 'Transactions.' In the former case, the Fellow communicating should see that the paper does not exceed in length about twelve pages of 'Proceedings,' and is not accompanied by elaborate illustrations; in the latter case, a short abstract of the main points of the communication must accompany the full paper. Since the MS. of a communication received and read, but not published by the Society, is retained in the possession of the Society,* an author is recommended not to send in the sole copy of his MS.; and it is advisable that the copy sent to the Society should be type-written, and, if possible, on a foolscap page.

It will be also convenient if, at the time of sending in the paper, the Assistant Secretary is informed what days of meeting will best suit the author for the reading, supposing it be decided that the paper should be read, and whether he wishes to be present, and whether he is prepared to illustrate the reading of the paper by experiments, projections, slides, diagrams, &c. The Society cannot, however, undertake always to fix the reading of the paper on the day or even one of the days proposed by the author.

2. When a communication has been "received," the first decision taken with regard to it is whether it should be "accepted for consideration." (Standing Order 30.)

If it be not accepted for consideration, the Fellow communicating

* While retaining a MS. not ordered for publication, the Council are generally willing to return to the author drawings, &c. illustrating the paper.

3. If it be accepted, the next decision relates to the reading of the paper.

According to the nature of the paper, and according to circumstances, the reading may consist of the title only being read by one of the Secretaries, or the paper may be read in whole or in part by one of the Secretaries, or the author may be invited to give an oral exposition of the contents of his paper, with such experimental or other illustrations as he may desire.

A decision having been come to as to the date of the reading, this will be communicated to the author, who, according to the decision taken, will be invited to be present, and may be requested to give an oral exposition.

4. When a paper has been judged suitable for publication in the 'Proceedings,' it is without delay set up in type, so that, if possible, printed copies may be in the hands of Fellows at the meeting at which the paper is read. A proof of the paper is sent to the author with the request that he will revise the proof as carefully as possible, and return it to the Assistant Secretary as soon as possible.

It may be found desirable to set up in type and even distribute at a meeting a paper which has been marked for reading, but about the publication of which no decision has as yet been come to. Hence, receipt of the proof must not be considered by the author as an indication that the paper will certainly be published.

5. If the author, in revising the proof thus sent to him, be led to make other than verbal or unimportant corrections, or to make additions, he must, in view of the publication of the paper, carefully date all such important corrections or additions. Any such corrections or additions introduced into any subsequent revise of the paper must be similarly dated.

A paper, when published, bears on it the date of reception of the MS.; this may be used in claims of priority, and the rule just given about dating corrections and additions is intended to prevent the author claiming the date of the reception of the MS. for important statements introduced into the paper after that date.

6. An author can, if time permits, receive, on application to the Assistant Secretary, any reasonable number of copies of the proof of his paper, corrected so far as is possible, in order that if he so wishes he may send, before the meeting at which the paper is read, copies of the proof to persons likely to take part in any discussion which may follow the reading of the paper. The Society leaves to the individual author the responsibility of thus making known the results of his labours before the account of those results is formally read; so far

as the Society itself is concerned, a paper communicated to it regarded as private until it has been read.

7. When a paper has been ordered for publication in the 'Proceedings' and read, it is desirable to avoid everything which would delay its publication. Hence an author should correct the first proof of his paper so carefully that he does not need to see a second proof or revise. It will frequently, however, be found desirable for the author to see such a revise after the paper has been read. It is most important that the corrections then made should be final, and should be made without delay. A demand for still another revise, or any delay in returning that revise, is nearly sure to prevent the paper appearing in the particular number of the 'Proceedings' which gives an account of the meeting at which the paper was read.

8. Editors of periodicals are often anxious to obtain copies of the papers read before the Society, in order that they may publish them in whole or in part, in their own periodicals, without waiting for the appearance of the papers in the 'Proceedings' of the Society. The Society offers no objection to this practice, provided that the copy sent to the periodical is identical with the paper as it will appear in the 'Proceedings.' For this reason the Society keeps the distribution of such copies in its own hands, and does not entrust it to the authors. Otherwise, the Society would have no guarantee against the following accidents, which, indeed, previous to the present arrangements having been made, did actually occur. If it were left to the author, he might send to a periodical an early proof of a paper which, before it was ordered for publication, needed large amendment, so that the paper, as it appeared in the said periodical, might differ widely from the paper as it appeared in the 'Proceedings.' Again, since a paper ordered for reading is, for the convenience of Fellows attending the meeting at which the paper is read, usually set up in type without delay, and may be, indeed often is, so set up before it has been decided to publish the paper, it might happen (and indeed, has happened) that an author sent to a periodical a copy of a paper as if it were about to appear in the 'Proceedings,' and yet that paper never so appeared. To avoid such undesirable occurrences the following practice has been adopted. With the proofs of his paper the author receives a form to fill up, stating to what periodicals he wishes separate copies of his paper, *so soon as it is finally passed for press*, to be sent, and the Society distributes the copies according to the list returned. The form sent to the author contains the titles of several periodicals to which separate copies will be sent on his returning the form with his signature attached. The author can modify the list as he wishes, striking out from or adding to it.

9. When a paper is printed off for the 'Proceedings' the author

10. One object of the regulations just described is to enable the Secretaries to publish as quickly as possible the papers (including abstracts) ordered for publication in the 'Proceedings,' and, save in special cases, the deliberations necessary for ordering these to be published do not take a long time.

Any decision as to publishing a paper in the 'Philosophical Transactions' necessarily takes a longer time, since the responsibility of this rests with the Sectional Committee or Committees and the Council, no such freedom of action being given to the Secretaries and Chairmen of Committees as is given in the case of papers published in the 'Proceedings.' The author, however, may greatly help to shorten the interval between the reception of a paper and its publication in the 'Philosophical Transactions' by attending to the following matters :—

(1) The MS. should be, if possible, type-written, or at least written in a legible hand, and *properly prepared as copy for press*, so that the subsequent corrections in spelling, grammar, construction of sentences, references, &c., may be as few as possible.

(2) When the paper is accompanied by illustrations, these should be sent in *ready for reproduction*. Figures, for instance, for which a "process" can be used, should be supplied in a condition in which the process may be directly applied; figures intended to be lithographed should be properly arranged as Plates of the proper size, and so on.

(3) When the author is requested to make changes or additions to his paper before it is published, these should be made without delay; the tardy appearance of papers in the 'Philosophical Transactions' has often been due to delay of this kind on the part of the author.

PROCEDURE IN THE NOMINATION OF THE COUNCIL.*

1. The subject of the new Council shall be taken into consideration at a Meeting of Council to be held on the last Thursday of October; and with the summons for that Meeting there shall be transmitted a list of the Members of the existing Council, with the number of their attendances at Meetings up to that date; also a List of the Fellows of the Society, with an indication of those who have at any time served on the Council, and the dates of their service.

2. At this Meeting the names of those Members of the existing Council who retire at the ensuing Anniversary shall be determined.

* From Minutes of Council, June 20, 1872.

... a List of not exceeding ten Fellows whom he proposes for the new Council, of whom five shall not have already served on the Council. Members not able to be present may send in similar lists previous to the Meeting. The several lists of names so proposed shall then be read out by the Secretary.

3. Before the next following Meeting, the President and Officers shall prepare a list of twenty-one names for consideration by the Council, which list shall include ten names selected from those proposed at the previous Meeting, or other names, if required to make up that number. The list so prepared, together with a statement of the names proposed, and the number of votes given for each, shall be sent out confidentially with the summons for the ensuing Meeting, at which Meeting the names to be finally recommended shall be balloted for. In taking the ballot, a copy of the list, prepared by the Officers, shall, with such alterations as he may see fit to make therein, be delivered by each Member of the Council present and voting, and the names found to have the majority of votes shall form the list to be recommended to the Society.

4. The President and Council shall then nominate by ballot, out of the proposed Council, the persons whom they recommend to the Society for election to the offices of President, Treasurer, Principals Secretaries, and Foreign Secretary, for the ensuing year.

PROCEDURE OF THE COUNCIL IN THE NOMINATION OF FOREIGN MEMBERS.

(*Statutes, Cap. I, §§ XIX—XXI.*)

XIX. "A book shall be kept in which Members of the Council may enter the names of those men of science whom they suggest as Foreign Members; each entry shall be signed by the proposer, and be accompanied by a short statement of the principal grounds on which the suggestion is made, and shall be valid for three years only.

XX. "When vacancies are to be filled up, a list of the persons so entered shall be sent to each member of the Council, together with notice of the Meeting at which the list will be considered. At the Meeting thus appointed further entries may be made, and the claims of those men of science whose names have been duly entered shall be considered, and a selection of names shall be made."

then appointed, may make nominations to the Society.

XXI. "At the second Meeting the selection of the Candidates to be nominated shall be by ballot; when, if two-thirds of the Members of the Council present be in favour of the nomination of any Candidate, he shall be proposed at the next Ordinary Meeting of the Society, and shall be put to the vote at the following Ordinary Meeting."

PROCEDURE OF THE COUNCIL IN THE ADJUDICATION OF THE MEDALS.

1. At the first Meeting on the subject of the Medals, the Members of Council are invited to *suggest* a name, or names, which they may deem worthy of consideration in the adjudication of each of the several Medals. The list of suggested names then formed to be entered on the Minutes, with power to Members of Council to add to it afterwards, if they see fit.

2. At a subsequent Meeting (or Meetings), to be held before the Midsummer Recess (at which additions may be made to the List of suggestions), every Member of the Council present is at liberty to *propose* for each Medal the name of a person whom he recommends to be selected to receive it, specifying the particular work or works which form the ground of his recommendation; and these proposals, being seconded, shall be entered on the Minutes. At the same time the proposer is expected to deposit with one of the Secretaries a detailed statement of the claims of the person recommended by him, for consultation by Members of the Council, should they so desire.

3. The Council to be summoned on the last Thursday of October, for the purpose of discussing the merits, as regards the award of the Medals of the persons severally proposed. Additional proposals may be made at this Meeting, if assented to by two-thirds of the Members present.

4. The Council to meet for further consideration of the proposals on the first Thursday in November; the awards to be decided either on that day or at an early adjourned Meeting.

CONDITIONS OF AWARD OF THE ROYAL SOCIETY'S MEDALS.

THE COPLEY MEDAL

is awarded to the living author of such philosophical research either published or communicated to the Society, as may appear to the Council to be deserving of that honour. The subject or subjects of research, on account of which the medal is awarded, must be specified in making the award.

No limitation is imposed either as to the period of time within which that research was made, or to the particular country to which its author may belong.

The medal may not be awarded to any person who is a Member of the Council at the time when the award is made.

The medal may be given more than once to the same person if the Council deem it expedient.

The medal is, as far as circumstances admit, awarded annually.

THE RUMFORD MEDAL,

consisting of a gold medal with a silver copy struck in the same die, is awarded once every second year "to the author of the most important discovery or useful improvement which shall be made and published by printing or in any way made known to the public in any part of Europe during the preceding two years on Heat or on Light, the preference always being given to such discoveries as, in the opinion of the President and Council of the Royal Society, tend most to promote the good of mankind.

"If during any term of years from the last award no new discovery or improvement shall have been made in any part of Europe relative to Light or Heat, in the opinion of the President and Council of sufficient importance to deserve the award, it may not be given, but the value of it may be reserved, and being laid out in the purchase of additional stock may augment the capital; and the interest of the same, by which the capital may from time to time be so augmented may be given in money" at a subsequent award with the two medals.

THE ROYAL MEDALS,

consisting each of a gold medal with a silver copy struck in the same die, are awarded annually by the Sovereign upon the recommendation of the Council, for the two most important contributions to the advancement of Natural Knowledge, published originally in Her Majesty's dominions within a period of not more than ten years and of not less than one year of the date of the award.

In the award of the Royal Medals one is given in each year to each of the two great divisions of Natural Knowledge.

is awarded annually for the most important discovery in Chemistry made in Europe or Anglo-America.

THE DARWIN MEDAL,

which is accompanied by a grant of £100, is given biennially in reward of work of acknowledged distinction (especially in Biology) in the field in which Mr. Darwin himself laboured. The award may be made either to a British subject or a foreigner, and without distinction of sex.

THE BUCHANAN MEDAL,

which is accompanied by a grant of the balance of the Buchanan Medal Fund which may have accumulated since the last award, is awarded every five years in respect of distinguished services to Hygienic Science or Practice in the direction either of original research or of professional, administrative, or constructive work, without limit of nationality or sex.

THE SYLVESTER MEDAL,

which is accompanied by a grant of the balance of the income of the Sylvester Medal Fund, is awarded triennially for the encouragement of Mathematical Research, irrespective of nationality.

HUGHES MEDAL.

Under the will of the late Professor E. E. Hughes, the Society has received a bequest, which will be applied to the award of a medal on the following conditions :—

1. A Gold Medal, to be called "The Hughes Medal," bearing a bust of the donor, and not exceeding in value the sum of £20, shall be awarded annually, together with the balance of the income of the Fund, to such person as the President and Council may consider the most worthy recipient, without restriction of sex or nationality, as the reward of original discovery in the Physical Sciences, particularly electricity and magnetism or their applications, such discovery or applications having been published not less than one year before the award.

2. If in any year the Council do not see fit to award the medal, owing to no one being deemed sufficiently worthy of it, the income for that year shall be invested and added to the principal of the Fund.

THE MACKINNON RESEARCH STUDENTSHIP.

Under the will of the late Sir William Mackinnon the Society has received a bequest to be applied to the foundation and endowment of

prizes or scholarships for the purpose of "furthering Natural and Physical Science, including Geology and Astronomy, and of furthering original research and investigation in Pathology," and the following regulations have been drawn up for the administration of the Trust:—

(1) A Studentship of the present annual value of £150 shall be offered, under the name of "The Mackinnon Research Studentship."

(2) The award shall be made by the Council on the recommendation of a Committee to be appointed by the Council.

(3) The Studentship shall in every case be awarded for one year but shall be renewable for a second year on the recommendation of the Committee after consideration of a report from the student upon his first year's work.

(4) The Studentship shall be awarded, so far as possible, alternately for investigations in the two main divisions of Science corresponding to the two series (A and B) of the 'Philosophical Transactions,' but not including Mathematics.

(5) Applications for the Studentship shall be invited by some mode of public announcement, to be hereafter determined, the terms of the announcement making reference to the conditions of the Bequest, the division of Science in which the last awarded Studentship has been held, and to the fact that preference will be given to a student of the alternate division.

(6) Candidates shall be required to state whether they hold other endowments, and the Committee shall have power to make inquiry into and take into account the other resources of the candidates.

(7) The research for which the Studentship is awarded shall be carried out only at a place approved by the Council, but the student shall not be allowed to carry on other work without the approval of the Council.

(8) The award shall be made always before the end of the Summer term, and the first award shall be made in the Summer of 1901.

(9) In the event of a Studentship not being awarded, or from any cause lapsing before the expiry of the term for which it is granted, the unexpended income of the fund shall be invested so as to be available for extraordinary expenditure in furtherance of the general objects of the Bequest.

(10) The Studentship shall be restricted to British subjects.

A statement of the foundation will be found in the Account of the Society's Trusts, in the 'Record.' The regulations for its administration, proposed by the Council, March 14, 1895, and adopted by the Founder, May 16, 1895, are here subjoined.

REGULATIONS.

1. That the Fund should not be applied in the form of a prize, medal, or reward, but should be devoted to the furtherance of knowledge in some special direction.

2. That, by preference, the interest accruing from the Fund during every three years be applied for the promotion of Physical Science and of Biology alternately.

3. That aid should, by preference, thus be given in Physical Science and Biology respectively, either to investigations or operations which require to be repeated from time to time, or to the development of some specified continued line of research.

In illustration of Regulation 3, the Council suggested as follows:—"Among subjects that would thus seem fitting for the application of the Fund, the following might be given as instances:—The renewal from time to time of magnetic observations in the British Isles; the compilation and publication, at intervals, of detailed lists of well-authenticated spectra; systematic determination of biological data in special regions or under special conditions; assistance to naturalists or others carrying on explorations or special investigations in foreign countries; continued bacteriological observations, similar to those carried out under the direction of the Water Research Committee and others."

REGULATIONS FOR ADMINISTERING THE JOULE FUND.

(Council Minutes, March 14, 1893.)

1. That the proceeds be applied in the form of a Studentship or Grant, to be awarded every other year, to assist Research, especially among younger men, in those branches of Physical Science more immediately connected with Joule's work.

2. That this Grant be International in its character, and awarded alternately in Great Britain and abroad, or in such order as the President and Council shall from time to time decide.

3. That it be awarded in Great Britain by the President and Council of the Royal Society; and, for award in France, offered to the "Académie des Sciences," Paris; and in Germany, to the "K

Akademie der Wissenschaften," Berlin; or, in any other country, the leading scientific institution, for award in that country.

4. That the award in Great Britain be made on the recommendation of a Committee, from time to time appointed by the President and Council of the Royal Society, but not of necessity confined to Fellows of the Society.

PUBLICATION GRANT REGULATIONS.

(*Council Minutes, June 15, 1899.*)

Amended November 7, 1901.

The following regulations for the administration of the Publication Grant from H.M. Treasury have been adopted by the Council :—

REGULATIONS FOR THE ADMINISTRATION OF THE GOVERNMENT PUBLICATION GRANT.

I. The allotment of the Grant shall be made by the President and Council.

II. In allotting the Grant, the President and Council shall "assist not merely their own publications, but also the adequate publication of scientific matter through other channels and in other ways."

III. In making allotments for the purpose of assisting the adequate publication of scientific matter other than the Society's own publications—

1. The President and Council shall consider—

(i.) Proposals made by Members of the Council.

(ii.) Applications made by other Scientific Societies through their usual official channels.

2. Proposals made by Members of the Council may be so made at any meeting of the Council, and applications by other scientific societies shall be reported by the Secretaries to the Council at the first Council Meeting after they have been received; but unless the Council, on grounds of urgency, shall otherwise order, no proposal or application shall be taken into consideration except at the meetings of the Council held in January and July, and no allotment shall be finally decided upon at the first of the said meetings if the decision can conveniently be postponed to the second of the said meetings.

3. Original memoirs shall be considered as having a first claim on the Grant, the aid being given towards the expense either of illustrations or of press-work; but the President and Council shall have power, if they see fit, to make an allotment in aid of other publications which tend to the advancement of natural knowledge, such as reports, abstracts, &c.

4. No decision of the President and Council at any one meeting of the Council to allot a portion of the Grant shall be valid unless

shall be made valid if confirmed by a majority at a subsequent meeting.

IV. The balance of the Grant remaining over at the close of the financial year, after deducting the amounts allotted under Section III, shall be placed to the credit of the General Funds of the Society, to assist in the production of the Society's own publications, unless the President and Council shall otherwise order.

REGULATIONS FOR ADMINISTERING THE SCIENTIFIC RELIEF FUND.*

The history of the Scientific Relief Fund will be found in the account of the Society's Trusts contained in the "Record." The following are the Regulations at present in force:—

REGULATIONS.

1. There shall be a fund called The Scientific Relief Fund, and the object of it shall be to aid such scientific men, or their families, as may from time to time require assistance.
2. All contributions to the fund shall be invested in the name of the Royal Society in such funds as are authorised for investment by Trustees; and in such manner as to form a separate account from that of the Society's other funded property.
3. The fund shall be administered by a Committee, called The Scientific Relief Committee, which shall consist of ten Fellows of the Royal Society, and it shall be the duty of such Committee to select the recipients on whose behalf the income derived from the fund may be properly applied—always reporting thereon to the Council for confirmation.
4. The capital of the Fund shall remain entire, and the interest only shall be at the disposal of the Committee.
5. If the whole of the interest shall not be expended in one year, the surplus shall be carried to the next year's account; and, if at any time any surplus in excess of the ordinary income of the year last past shall thus accrue, the Council shall cause the whole, or part of it, to be added to the capital sum already invested; or, should they think fit, may cause any accumulated interest to be invested as unexpended income, the securities purchased being liable from time to time to be realised, and the proceeds expended as income.

* Mainly codified from the Original Regulations adopted by the Council Nov. 3, 1859 (see also Minutes of May 26, 1859), and subsequent modifications passed by the Council on Dec. 22, 1859, Jan. 18, 1866, April 30, 1891, Jan. 19, 1893, April 30, 1896, Nov. 5, 1896.

6. No application for relief shall be entertained except on the recommendation of the President of one of the following Scientific Societies:—The Chemical, Entomological, Geological, Linnean, London Mathematical, Physical, Royal, Royal Astronomical, Royal Geographical, Royal Meteorological, Royal Irish Academy, Royal Society of Edinburgh, Society of Antiquaries or Zoological Society; it being understood that the several Presidents will consult their respective Councils as to the person whom they intend to recommend for relief.
7. The members of the Committee shall be appointed by the Council, and shall consist of ten members, each of whom shall serve for five years, so that two retire annually, and be not eligible for re-appointment on the occasion of their retiring. Should a vacancy occur by reason of death or otherwise, at an intermediate time, the Council shall appoint a person to fill the vacancy, and the person so appointed shall retire at the time the member whose place he fills would have retired had he continued until then to be a member, but if he have not served more than two years shall be eligible for re-appointment.
8. The Council shall annually appoint a member of the Committee to act as Chairman for the ensuing year. The Chairman shall have power to nominate one of the Committee to act as his deputy.
9. The Chairman, or his deputy, shall have power to summon a meeting of the Committee at his discretion, and shall fix the time of such meeting.
10. Three of the Committee shall form a quorum.
11. The Treasurer of the Society shall have power, on the requisition of the Chairman of the Committee, or of his deputy, made in pursuance of a resolution of the Committee, but subject nevertheless, to the provisions of Regulation 12, to make payments out of the Scientific Relief Fund not exceeding £100 in any one case, reporting such action to the Council at its next meeting.
12. The Chairman, or his deputy, shall, notwithstanding Regulation 6, have power to act in urgent cases during vacations of the Society, after consultation with one of the Secretaries of the Society, without calling the Committee together. In such cases the Chairman shall, after the vacation, summon a meeting of the Committee and report his action.

In the first Report of the Committee, dated November 30, 1861, it is stated that "It formed no part of the scheme to attempt the grant of annuities; it was rather intended to afford *prompt* relief of the immediate wants of those upon whom sudden affliction had fallen

tion of the founders, although it has not been embodied in a regulation, has been continued, as a policy, to the present time.

Applicants are desired to fill in a form which can be obtained from the Assistant Secretary of the Royal Society, in which (confidential) information is requested upon the following points:—

1. Name, Age, and Social Condition.
2. Nature of Claims, stating scientific work done by the subject of the proposed grant, or by the member of his family on whose scientific claim he relies, appending a list of his principal contributions to science.
3. The nature of the emergency, and how it has arisen.
4. Whether the applicant is receiving, or has received, during the past six months, pecuniary aid from any other source.
5. Whether the applicant is entitled or able, in the circumstances which have arisen, to look to any other assistance; and, if so, what is the source and extent of such expected assistance.
6. Particulars of—

Number in family.

How many are self-supporting.

How many are partially dependent.

How many are wholly dependent.

In 1886 Sir William (now Lord) Armstrong gave a sum of £7,800 to the Scientific Relief Fund, on the understanding that the said fund should be used for remission of fees in cases of urgent necessity. By a Resolution of Council passed December 10, 1889, "the question of the remission of fees to Fellows of the Society in impecunious circumstances is reserved for the sole consideration of the President and Council of the Society, the amount thus from time to time bestowed being communicated to the Scientific Relief Committee."

NATIONAL PHYSICAL LABORATORY.

Her Majesty's Government having agreed to ask Parliament for a grant not exceeding £12,000 for the buildings and equipment of a National Physical Laboratory, and for an annual sum of £4,000 for five years certain as a grant in aid of the expenses of conducting the Institution, the appended scheme for the organization and management of the Laboratory has been drawn up by the Royal Society and approved by Her Majesty's Government.

SCHEME OF ORGANIZATION.

1. The name of the Institution shall be the National Physics Laboratory. The Kew Observatory shall be incorporated therewith.

2. The ultimate control of the Institution shall be vested in the President and Council of the Royal Society, who in the exercise thereof may from time to time issue such directions as they may think fit to the General Board and Executive Committee hereinafter described. The President of the Royal Society shall be the Chairman of the Governing Body as hereinafter defined. The income and all other property of the Institution shall be vested in the Royal Society for the purposes of the Institution.

3. For the present, and until otherwise ordered by the President and Council of the Royal Society, with the approval of H.M. Treasury, there shall be a Governing Body for the Institution consisting of a General Board and an Executive Committee, the constitution and duties of which shall be as hereinafter defined. Provided always that the Permanent Secretary of H.M. Board of Trade shall be *ex officio* a member of the Governing Body, and that the choice of members of the Governing Body, or of any Committee thereof, shall not be confined to Fellows of the Royal Society.

4. The General Board shall consist of the President, Treasurer and Secretaries of the Royal Society, the Vice-Chairman of the Board (appointed as defined below by the President and Council of the Royal Society), the Permanent Secretary of the Board of Trade and of thirty-six ordinary members.

Twenty-four of the ordinary members shall be appointed by the President and Council of the Royal Society; of the remaining twelve ordinary members, two shall be nominated for appointment by the Council of each of the following Institutions, as being fitted to represent commercial interests in connection with the Laboratory:—

The Institution of Civil Engineers.

The Institution of Mechanical Engineers.

The Institution of Electrical Engineers.

The Iron and Steel Institute.

The Institution of Naval Architects.

The Society of Chemical Industry.

In the selection of ordinary members of the General Board care shall be taken that Scotland and Ireland are represented

member of that Board during his tenure of office on the Executive Committee, but shall be regarded as an additional, and not as an ordinary, member of the Board.

5. The Executive Committee shall consist of the President, Treasurer, and one of the Secretaries of the Royal Society; the Vice-Chairman of the Executive Committee (appointed as defined below); the Permanent Secretary of the Board of Trade; six persons appointed by the President and Council of the Royal Society from among those who are members of the Kew Observatory Committee at the time when the Kew Observatory is incorporated in the National Physical Laboratory (two of these six persons shall retire at the end of every two years, and vacancies occurring amongst them by retirement or otherwise shall not be filled up); and of twelve ordinary members.

The ordinary members shall be nominated by the President and Council of the Royal Society, but one-half shall be chosen from among those members of the General Board who have been nominated as fitted to represent commercial interests on that Board.

Those members of the Executive Committee who are Fellows of the Royal Society, shall be appointed by the President and Council to be the Gassiot Committee of the Royal Society.

6. The Vice-Chairman of the General Board shall be appointed by the President and Council of the Royal Society, and shall also be Vice-Chairman of the Executive Committee. He shall hold office for six years, and shall be eligible for re-appointment, but shall not hold office for more than twelve years.

7. At least one-sixth of the ordinary members of the General Board and of the Executive Committee shall retire annually.

In the case of the General Board, the retiring ordinary members shall be selected by seniority, four being selected from the members nominated by the President and Council of the Royal Society, and two from the members nominated by the Technical Societies named in the scheme.

In the case of the Executive Committee, the retiring ordinary members shall be selected by seniority, one being selected from the members nominated by the President and Council of the Royal Society, and one from the members nominated by the Technical Societies named in the scheme.

No retiring member of the General Board or of the Executive Committee shall be eligible for re-appointment until at least one year has elapsed from the date of his retirement.

The President and Council shall have power to remove from the

General Board and from the Executive Committee any member either whom they may judge to be disqualified.

Vacancies on the General Board or on the Executive Committee due to death, resignation, or removal by the President and Council of the Royal Society, shall be filled by the President and Council of the Royal Society, provided always that—

- (1) Any person so appointed shall, for the purposes of the regulations for retirement from the Board or Committee, be regarded at the time of his appointment as having served for the same period as the member to whose place he succeeds.
- (2) If the vacancy on the General Board be caused by one of the persons nominated as fitted to represent commercial interests ceasing to be a member of the Board, the President and Council of the Royal Society shall choose his successor from among a list of names recommended by the Councils of the Institutions named in Section 4.
- (3) If a vacancy on the Executive Committee be caused by one of the persons nominated as fitted to represent commercial interests ceasing to be a member of the Committee, his successor shall either be selected from among those members of the General Board who were nominated as fitted to represent commercial interests, or shall be nominated by the President and Council of the Royal Society after consultation with the Councils of the Institutions named in Section 4.

The President and Council of the Royal Society shall determine the order of the seniority of the members of the first General Board and of the first Executive Committee for the purposes of the regulations for retirement.

The Executive Committee.

8. The Executive Committee shall have the immediate management of the National Physical Laboratory; shall appoint and dismiss the officials, except the Director; and shall determine the nature of the work to be undertaken from time to time.

The General Board.

9. A meeting of the General Board shall be held in March, at which the Executive Committee shall present a report on the work and finances of the National Physical Laboratory during the year.

circulated among the members of the General Board at least one week before the meeting, and after the meeting shall be forwarded to the President and Council of the Royal Society, together with any further report, resolutions, or recommendations which may be added by the General Board.

The Executive Committee shall also lay before the General Board at its meeting in March a statement as to the work which it is proposed to undertake in the Laboratory during the ensuing year. This statement shall be circulated among members of the Board at least a week before the meeting; and the General Board may make such recommendations relative to the statement, or to the future work of the National Physical Laboratory, as they may think fit.

These recommendations shall be laid before the Executive Committee for their consideration.

Sub-Committees

10. The Executive Committee may from time to time appoint Sub-Committees, of which the members shall not necessarily be members of the Executive Committee or of the General Board, either to superintend or to assist in certain specified investigations, or to superintend some department of the National Physical Laboratory.

The Director.

11. The Director of the National Physical Laboratory shall be appointed by the President and Council of the Royal Society after consultation with the Executive Committee, on such terms as the President and Council may determine, and shall be removable by the President and Council. He shall be responsible to, and shall take instructions from, the Executive Committee, but, subject to such instructions, he shall have the sole direction and control of the officials of the National Physical Laboratory and of the work done within it.

The Executive Committee may delegate its power of appointing and dismissing the officials of the Institution to the Director in such cases as it may think fit.

The Director shall neither be allowed nor be called upon to undertake work not connected with the National Physical Laboratory, except with the consent of the Executive Committee.

12. The Royal Society shall open a banking account, to be called "The National Physical Laboratory Account of the Royal Society," in which all sums received by the Executive Committee for the purposes of the Institution shall be paid. The Treasurer of the Royal Society shall also pay into this account all sums received by him for the same purposes, after deducting therefrom such amounts as he shall be directed by the President and Council, with the approval of the Treasury, to retain for the purpose of defraying any expenses which the Royal Society may incur in the exercise of its control of the Institution.

The Executive Committee shall be empowered to draw on this account for the purposes of the Institution by cheques signed by such members of the Executive Committee as may be authorised by the Committee to do so.

Legal Proceedings.

13. Any legal proceedings with regard to the affairs of the Institution, which it may become necessary to institute or defend, shall be instituted or defended by the Solicitors of the Royal Society, in their name and on behalf of the Royal Society upon the instructions of the Executive Committee, but no such proceedings shall be instituted or defended without the order of the President and Council of the Royal Society.

The Kew Observatory Committee of the Royal Society.

"The Kew Observatory Committee of the Royal Society," incorporated under the Companies Act, 1867, shall be wound up; and the property thereof shall be held by the Royal Society for the purposes of the Institution.

GENERAL BOARD OF THE NATIONAL PHYSICAL LABORATORY.

Retires
December

Ex-Officio
Members.

- The President of the Royal Society.
1906 The Vice-Chairman of the Board (Lord Rayleigh, F.R.S.).
The Treasurer of the Royal Society.
The Secretaries of the Royal Society.
The Permanent Secretary of the Board of Trade.

1902 Dr. A. Buchan, F.R.S.
 1902 Capt. E. W. Creak, F.R.S.
 1902 Professor R. B. Clifton, F.R.S.
 1903 Sir A. Noble, F.R.S.
 1903 Mr. R. E. Crompton
 1903 Dr. R. H. Scott, F.R.S.
 1903 Mr. W. N. Shaw, F.R.S.
 1904 Professor A. Schuster, F.R.S.
 1904 Professor J. A. Ewing, F.R.S.
 1904 Dr. Ludwig Mond, F.R.S.
 1904 Professor G. C. Foster, F.R.S.
 1905 Professor J. J. Thomson, F.R.S.
 1905 Professor J. Joly, F.R.S.
 1905 Sir W. Wharton, F.R.S.
 1905 Lord Kelvin, F.R.S.
 1906 Dr. T. E. Thorpe, For. Sec. R.S.
 1906 Mr. C. E. Stromeyer
 1906 Prof. W. C. Unwin, F.R.S.
 1906 Professor J. Perry, F.R.S.
 1907 Professor A. W. Rücker, F.R.S.
 1907 Mr. C. V. Boys, F.R.S.
 1907 Professor H. L. Callendar, F.R.S.
 1907 Mr. J. W. Swan, F.R.S.

Nominated by the
 President and
 Council of the
 Royal Society.

1902 Professor W. E. Ayrton (Instit. Electr.
 Engin.)
 1902 Mr. G. Beilby (Soc. of Chem. Industry)
 1903 Sir E. Carbutt (Inst. Mechan. Engin.)
 1903 Mr. J. T. Milton (Inst. Naval Archit.)
 1904 Sir W. Roberts-Austen (Iron and Steel
 Instit.)
 1904 Sir W. H. Preece (Inst. Civil Engin.)
 1905 Mr. A. Siemens (Inst. Elec. Engin.)
 1905 Mr. W. F. Reid (Soc. Chem. Industry)
 1906 Sir J. Wolfe-Barry (Inst. Civ. Engin.)
 1906 Sir B. Samuelson (Iron and Steel Inst.)
 1907 Dr. F. Elgar (Inst. Naval Archit.)
 1907 Mr. W. H. Maw (Inst. Mechan. Engin.)

Nominated by the
 Technical Soci-
 eties named in
 the Scheme.

Retires
December

- | | | |
|------|--|--|
| | The President of the Royal Society. | |
| 1906 | The Vice-Chairman of the Committee (Lord Rayleigh, F.R.S.) | |
| | The Treasurer of the Royal Society. | |
| | A Secretary of the Royal Society (Dr. J. Larmor). | |
| | The Permanent Secretary of the Board of Trade. | |
| 1902 | Professor R. B. Clifton, F.R.S. | |
| 1903 | Sir Andrew Noble, F.R.S. | |
| 1904 | Professor A. Schuster, F.R.S. | |
| 1905 | Professor J. J. Thomson, F.R.S. | |
| 1906 | Dr. T. E. Thorpe, For. Sec. R.S. | |
| 1907 | Professor A. W. Rücker, F.R.S. | |
| 1902 | Sir W. de W. Abney, F.R.S. | } Members of the
former Kew C
servatory Co
mittee. |
| 1902 | Capt. Creak, F.R.S. | |
| 1904 | Professor G. C. Foster, F.R.S. | |
| 1906 | Professor J. Perry, F.R.S. | |
| 1902 | Mr. G. Beilby | } Members of the
General Bo
nominated by t
Technical So
eties named
the Scheme. |
| 1903 | Sir Edward Carbutt | |
| 1904 | Sir William Roberts-Austen, F.R.S. | |
| 1905 | Mr. A. Siemens | |
| 1906 | Sir John Wolfe-Barry, F.R.S. | |
| 1907 | Dr. F. Elgar, F.R.S. | |

I.

1. The Government Grant shall be administered by a General Committee, consisting of the President and Council of the Royal Society for the time being, of the following *ex officio* Members:—

The President of the Royal Society of Edinburgh and one other Representative,

The President of the Royal Irish Academy and one other Representative,

The Presidents of—

The British Association,

The London Mathematical Society,

The Royal Astronomical Society,

The Physical Society,

The Institution of Civil Engineers,

The Institution of Mechanical Engineers,

The Institution of Electrical Engineers,

The Chemical Society,

The Iron and Steel Institute,

The Geological Society,

The Royal Geographical Society,

The Linnean Society,

The Zoological Society,

The Anthropological Institute,

The Royal College of Physicians,

The Royal College of Surgeons,

and of the Members, for the time being, of the several Boards hereinafter spoken of.

2. Seven Boards shall be established, viz.:—

A. For the consideration of Applications relating to Mathematics, Mathematical Physics, Crystallography and Mathematical Astronomy.

B. For the consideration of Applications relating to Experimental Physics, Observational Astronomy, and Meteorology.

C. For the consideration of Applications relating to Chemistry and Metallurgy.

D. For the consideration of Applications relating to Geology, Palæontology, Mineralogy, and Geography.

E. For the consideration of Applications relating to Botany.

F. For the consideration of Applications relating to Zoology and Comparative Anatomy.

G. For the consideration of Applications relating to (Animal) Physiology and Medical Subjects.

3. Each Board shall consist of eight members, to be appointed by the President and Council of the Royal Society, Scotland and Ireland, being as far as possible represented on each Board, and each member shall serve for four years, so that two retire annually, and be eligible for re-appointment on the occasion of their retiring. Should a vacancy occur by reason of death or otherwise, at any intermediate time, the Council shall appoint a person to fill the vacancy, and the person so appointed shall retire at the time the member whose place he fills would have retired had he continued until then to be a member, but if he have not served more than two years shall be eligible for re-appointment.

4. The President and Council of the Royal Society shall appoint a member of each Board to be Chairman of the Board. All communications made to and by the Board shall be made through the Chairman, who shall be held responsible for the management of the business of the Board, and who shall have a second or casting vote. When a Chairman is unable to perform the duties of the Chair, the Council shall appoint a member of the Board to act as his deputy, and to exercise his powers.

II.

5. In order to meet any extraordinary demands which may be made upon the Grant, a Reserve Fund shall be gradually accumulated, but so that it shall not at any time exceed £2,000.

6. A Grant, the payment of which is intended to be completed within the twelvemonth following upon the meeting of the Committee at which the Grant was made, shall be called an "ordinary" Grant. The Committee shall, however, if they see fit, make Grants "personal" or other expenditure, each of which may extend over a period not exceeding three years, but in no case shall such a personal Grant exceed £300 per annum. For this purpose the Committee may, in any one year, reserve from the Fund of the year an amount sufficient to cover the payment during the period for which a Grant has been made, the continuance of the payment of the instalments of such Grants to be conditional on the recipients furnishing as hereinafter provided, evidence satisfactory to the Committee that the object of the Grant is being properly carried out. Such Grants shall be called "extended" Grants.

III.

7. Adequate notice shall be given in the public papers each year that applications for Grants must be sent in to the Royal Society.

8. Each applicant shall be required to furnish information under the following heads:—

- a. The nature of the research in which he desires to engage, and of the scientific results expected to follow therefrom.
- b. The amount asked for.
- c. Whether he has received any previous Grant from any source for the same object, and if so, with what results.
- d. Whether any portion of the Grant is to be devoted to his own personal expenses.
- e. What apparatus, if any, of permanent value he will require; so that any instruments, already at the disposal of the Committee, may be utilised.

9. As soon as possible after February 1st in each year, the Secretaries of the Royal Society shall cause to be drawn up a list of all the applications, arranged, according to the nature of the research in each application, in classes corresponding to the above-mentioned Boards, and shall cause such list to be distributed to all Members of the Committee. This list shall contain a brief statement of the information received under Clause 8.

10. The Secretaries of the Royal Society shall further cause to be sent to the Chairman of each Board a list of the applications belonging to the class corresponding to his Board, together with any other information, letters, documents, &c., which may have been furnished by the several applicants.

11. Each Board, having taken into consideration the applications submitted to it, making such use of correspondence between Members of the Board as may be desirable for the purpose, shall send to the Secretaries of the Royal Society, some day in May to be determined each year by the President and Council of the Royal Society, a written Report, stating, with reference to each such application, whether they recommend the acceptance of it in part or in whole, or the rejection of it; and the Secretaries of the Royal Society shall cause the Reports of the several Boards to be distributed as soon as possible to all Members of the Committee.

12. Should any application appear to the Secretaries of the Royal Society to relate to more than one Board, they shall, with the approval of the President of the Royal Society, refer the application to the several Boards to which it appears to relate. In such cases the Chairman of one of the Boards concerned shall, on the nomination of the President of the Royal Society, be requested to take charge of the application, to be responsible for its being laid before the Boards concerned, and to present the Report of those Boards on

the application at the same time that he presents the usual Report of his own Board.

13. It shall be in the power of any Board to initiate an inquiry and to recommend a Grant for the purpose, and such a recommendation having been reported to the Committee with the other recommendations of the Board, shall take its place among applications recommended to the Committee for acceptance, in spite of application not having been made in the ordinary way.

14. The Committee shall meet on the third Wednesday (or, if that fall in Whitsun Week, the fourth Wednesday) in May, at which meeting the Reports of the Boards shall be read, considered (the Chairman of each Board, or in his place some other Member of it, giving such explanations with regard to the decisions of the Board as may seem desirable), and voted upon. The voting shall be by show of hands, unless any Member demands a ballot, in which case it shall be by ballot.

15. In the case of applications which have been recommended by the appropriate Board, or recommendations initiated by any Board, the voting in Committee shall be by simple majority of those present, except in the case of "extended" Grants coming under Clause 6, which Grants shall require the assent of two-thirds of those present.

16. Applications which have been rejected by the appropriate Board shall not be reconsidered in Committee except with the consent of two-thirds of those present, and any applications so reconsidered shall not be granted by the Committee otherwise than by a majority of two-thirds; likewise a proposal to increase the amount of any Grant made by a Board shall not be considered in Committee except with the consent of two-thirds of those present, and the increase so considered shall not be granted by the Committee otherwise than by a majority of two-thirds.

17. The Committee shall have power to place each year at the disposal of the President and Council of the Royal Society, a sum not exceeding £500 to meet any pressing demands upon the Fund which may be made between the annual meetings of the Committee.

18. The President of the Royal Society shall further have power, in case he is of opinion that there is urgency for an immediate Grant of a sum too large to be provided by the Fund referred to in 17, and necessitating a call upon the Reserve Fund, to summon a Special Meeting of the Committee, who, if they see fit, shall decide on such Grant, provided always that due notice of such meeting, with a statement of the purpose for which it is called, be sent to each Member of Committee fifteen days before the date fixed for the meeting.

every applicant shall, on his applying, be duly informed of these conditions:—

- i. That all instruments, specimens, objects, or materials of permanent value, whether purchased or obtained out of, or by means of, the Grant, or supplied from among those at the disposal of the Committee, are to be regarded, unless the Committee decide otherwise, as the property of the Government, and are to be returned by the applicant, for disposal according to the orders of the Committee, at the conclusion of his Research, or at such other time as the Committee may determine.
- ii. That every one receiving a Grant shall furnish to the Committee, on or before the 31st of December following upon the allotment of the Grant, a Report (or, if the object of the Grant be not then attained, an interim Report, to be renewed at the same date in each subsequent year until a final Report can be furnished), containing (a) a brief statement showing the results arrived at, or the stage which the inquiry has reached; (b) a general statement of the expenditure incurred, accompanied, so far as is possible, with vouchers; (c) a list of the instruments, specimens, objects or materials, purchased or obtained out of the Grant, or supplied by the Committee, which are at present in his possession; and (d) references to any Transactions, Journals, or other publications in which results of the Research have been printed.
- iii. That when a Grant is asked for a definite Research, for which an estimate can be obtained, applicants are required, with their applications, to furnish such an estimate.
- iv. That when an application is for a Grant to two or more persons to act as a Committee for the purpose of carrying out some scientific object, the application shall state which Member of the proposed Committee is willing to act as Secretary, to be responsible for furnishing the Report, for receiving and disbursing the money, and in general for the conduct of the business of the Committee.
- v. That Grants shall lapse at the end of two years from the date of allotment, if application for payment be not made within that time.
- vi. That papers in which results are published which have been obtained through and furnished by the Government Grant, should contain an acknowledgment of that fact.

The Committee shall further have power to attach to any Grant any other conditions which they may think desirable.

20. Every applicant to whom a Grant is made shall, before a Grant of the Grant is paid to him, be required to sign an engagement (which may be incorporated in the receipt for the money) that he is prepared to carry out the general conditions applicable to Grants, as well as any conditions which may be attached to a particular Grant.

21. Printed copies of the Reports, provided for by Regulation 19, § ii, shall each year, so soon as possible after January 31, be submitted to the several Boards; and it shall be the duty of each Board to examine the Reports relating to Grants recommended by it, and to report to the Committee (or, in case of urgency, to the Council of the Royal Society) any deficiencies therein, or any action relating thereto which the Board thinks desirable.

22. In the case of a Grant recommended by a Board being for the purpose of enabling the applicant to collect by means of the Grant or part of it, specimens, objects, or materials of permanent value, the Board shall, whenever it is able to do so, add to its recommendations conditions as to the final disposal of such specimens, objects, or materials.

23. When an application is for a Grant to two or more persons, the Board may act as a Committee for the purpose of carrying out some scientific object, the application shall state which Member of the proposed Committee is willing to act as Secretary, to be responsible for furnishing the Report, for receiving and disbursing the money, and in general for the conduct of the business of the Committee.

24. The recipient of an "extended" Grant shall make to the Board which recommended the Grant, half-yearly, or, if the Board desire it, oftener, such Reports as the Board may determine concerning the way in which the object of the Grant is being carried out, and each such recipient shall, on receiving notice that the Grant has been made to him, be informed of his duty to make such Reports, and shall express in writing his willingness to do so. Should any Board be of opinion, after receiving such Reports, that the object of the Grant is not being properly carried out, they shall report the same at the next meeting of the Committee. The Chairman of the Board shall move at the meeting of the Committee that the Grant be discontinued, and if the Committee by a majority approve of the Grant being discontinued, it shall be discontinued.

26. A Schedule shall be kept of all instruments, specimens, &c., of permanent value, in furtherance of Regulation 19, and of Clause e of Regulation 8.

27. A Professional Accountant shall be employed to audit the accounts in chief. A preliminary examination of the detailed accounts and vouchers shall be made by the Clerk to the Committee, who is instructed to submit to the Chairman of the appropriate Boards the cases concerning which he is not satisfied; and the Chairman of a Board shall be requested to examine, if necessary, any such case so submitted to him, and to take such action as may seem to him desirable.

APPENDIX TO THE GOVERNMENT GRANT REGULATIONS.

I.

INSTRUCTIONS FOR THE GOVERNMENT GRANT BOARDS.

(Minutes of Council, March 15, 1894.)

1. Each Chairman has authority to summon his Board, whenever he thinks fit (in addition to any Meeting or Meetings of the Board which may be appointed by the Council), to meet either at the Rooms of the Royal Society, during the hours specified in the Statutes (chap. xiv, § 7), or at such other place as he may deem desirable.

2. The summonses are to be issued by the Clerk at the direction of the Chairman.

3. Any four members of a Board are to be a quorum of that Board; but the decisions arrived at at a Meeting of a Board at which less than four members are present shall be valid, if subsequently agreed to in writing by not less than five members in all.

4. It is desirable that each year a Meeting of each Board should be held at the Society's Rooms soon after the receipt by the Chairman of the applications, and that another Meeting to come to final decisions on the applications should be held, also at the Society's Rooms, on the day fixed by the Council; but the Chairman may, if he finds it desirable, change the day of the latter Meeting, and he may even omit the one or the other of these Meetings, should he judge the one or the other to be unnecessary.

5. If the Chairman of a Board, on receiving a list of applications under Regulation 10, shall find that any application on that list is, in

his opinion, more appropriate to another Board than his own, or to any application which ought, from its nature, to have been referred to a Board or to Boards besides his own, is referred only to his own Board, or that an application proper to his Board has been referred to another Board, he shall at once report the same to the Secretaries of the Royal Society.

6. The Chairman of a Board may authorise the transfer of an instrument, specimen, &c., obtained by means of a Government Grant, and no longer needed by the person by whom it was obtained, or to whom it was assigned, to any other person applying to the Government Grant Committee for the loan of the instrument, specimen, &c., if in his judgment such a transfer is desirable. He shall in each case report his having done so to the Secretaries of the Royal Society.

7. The Chairman of each Board is expected to see that the Annual Reports* furnished by Grantees give an adequate account of the work done and the results attained, and in cases where the Reports are inadequate, to inform the Clerk of the fact in order that he may communicate with such Grantees.

8. The Chairman of a Board is requested to examine, with the assistance if necessary of one or more members of his Board, any case submitted to him by the Clerk to the Committee in pursuance of Regulation 27, and to take such action as may seem to him desirable.

II.

INSTRUCTIONS FOR A COMMITTEE APPOINTED FOR THE PURPOSE OF ADMINISTERING A GRANT UNDER SECTION 23 OF THE GOVERNMENT GRANT REGULATIONS.

(Minutes of Council, February 22, 1895.)

1. The Secretary of the Committee has authority to call a Meeting of the Committee whenever he thinks desirable, either at the Room of the Royal Society, during the hours specified in the Statute (chap. xiv, § 7), or at such other place as he may deem desirable.

2. The summons for each such Meeting shall be issued by the Clerk, from the Society's Apartments.

3. To constitute a quorum, at any meeting of the Committee, at least one-half of the Members of the Committee, the Secretary being one, must be present.

4. The provisions of Regulation 19 apply in all particulars to a Committee as well as to an individual applicant, and every Com-

* By "Report" is not meant a complete scientific exposition of the inquiry, but such a statement as will show that the Grantee has expended the money for the purpose mentioned in his Application, and will briefly indicate to what extent he has attained the objects of the inquiry.

the contrary by the Council of the Royal Society, or by the General Committee) until such time as the final Report upon their research has been furnished.

5. When a Committee is re-appointed, with or without change as to the persons composing it, for continuing a research, and receiving a new Grant, it is to be considered a new Committee for all purposes of expenditure and reporting, and is in no way responsible for expenses incurred by its predecessor.

The above instructions are intended only for the cases in which a Committee is especially constituted in order to receive a Grant. Grants may be made to already existing Committees established independently of any application for a Grant. In such cases the above instructions are not intended to apply, and the procedure of meetings, constitution of quorum, &c., of such a Committee must be determined in each case by the Committee itself. In all such latter cases the Chairman or Secretary of the Committee, or some other person, must be authorised by the Committee to be the responsible representative of the Committee in question before the Government Grant Committee, to make application to receive moneys, to furnish reports, &c., &c.

December 1, 1898.

GOVERNMENT GRANT BOARDS, 1902.

BOARD A.

Chairman—Major MacMahon.

	Retire March 1st
* <i>Prof. Forsyth, Prof. Greenhill</i>	1902
Mr. Basset, Prof. H. H. Turner	1903
Prof. Burnside, Prof. Love	1904
Prof. Hill, Major MacMahon	1905
Prof. Bryan, Prof. Lamb	1906

BOARD B.

Chairman—Prof. G. Carey Foster.

<i>Mr. S. Bidwell, Lord Kelvin</i>	1902
Prof. Fleming, Prof. G. Carey Foster	1903
Prof. Callendar, Mr. McClean	1904
Mr. Glazebrook, Prof. Joly	1905
Prof. J. J. Thomson, Prof. Gray	1906

* Members whose names are in italics serve only *until* March 1, 1902. The two members named last on each Board serve only *from* March 1, 1902.

BOARD C.

Chairman—Dr. Gladstone.

Retire March 1st

<i>Prof. Dunstan, Sir W. C. Roberts-Austen</i>	1902
Prof. Liveing, Prof. Ramsay	1903
Prof. McLeod, Dr. H. Müller	1904
Dr. Gladstone, Prof. Japp	1905
Dr. Collie, Prof. W. H. Perkin, jun.	1906

BOARD D.

Chairman—Mr. Hudleston.

<i>Prof. Judd, Prof. Dawkins</i>	1902
Mr. L. Fletcher, Mr. J. E. Marr	1903
Mr. Hudleston, Lieut.-Gen. McMahon	1904
Prof. Seeley, Admiral Sir W. Wharton	1905
Prof. Bonney, Prof. Geikie	1906

BOARD E.

Chairman—Dr. D. H. Scott.

<i>Mr. Gardiner, Prof. Oliver</i>	1902
Sir E. Fry, Mr. G. Murray	1903
Mr. Seward, Prof. J. W. H. Trail	1904
Mr. H. T. Brown, Dr. D. H. Scott	1905
Mr. Gamble, Prof. J. R. Green	1906

BOARD F.

Chairman—Prof. Poulton.

<i>Mr. Godman, Prof. J. C. Ewart</i>	1902
Mr. Elwes, Prof. Poulton	1903
Prof. A. Newton, Prof. Weldon	1904
Prof. Cunningham, Prof. Miall	1905
Prof. Haddon, Dr. Traquair	1906

BOARD G.

Chairman—Prof. Ferrier.

<i>Prof. W. Watson Cheyne, Dr. Waller</i>	1902
Prof. Ferrier, Prof. Schäfer	1903
Dr. Langley, Dr. Sidney Martin	1904
Sir T. Lauder Brunton, Prof. Gotch	1905
Prof. H. W. H.	1906

Account of the Appropriation of the Sum of £4,000 (the Government Grant) annually voted by Parliament for Scientific Investigations.

April 1, 1900, to March 31, 1901.

	£	s.	d.
Lt.-Col. A. Cunningham, for the Complete Checking of a Set of Tables of Quadratic Partitions of all Primes under 100,000	30	0	0
Prof. H. H. Turner, for the Measurement and Reduction of 1,180 Plates according to the Scheme of the Astrographic Conference of 1887	100	0	0
Dr. A. M. W. Downing, for the Continuation and Completion of the Revision of Taylor's Meridian Observations at Madras	35	0	0
Thomas Wright, for the Reduction of Tidal Observations and Determination of Harmonic Constants for various ports in Australia	50	0	0
W. E. Wilson, for the Purchase of a Callendar's Patent Electric Recorder	35	0	0
Dr. J. T. Bottomley, for Continuation of Research on Thermal Radiation in Absolute Measure	50	0	0
W. F. Denning, for (1) the Observation of Shooting Stars; (2) the Comparison and Reduction of Observations made by other Observers; (3) Search for New Comets (<i>personal</i>)	25	0	0
Meteorological Council, for Continuation of Researches upon Atmospheric Electricity	80	0	0
Dr. W. Peddie, for Investigations on the Torsional Oscillation of Wires (for the Construction of an Instrument)	10	0	0
W. G. Walker, for a Research on the Resistance of Surfaces and Bodies in the Air (Second Series)	25	0	0
J. E. Petavel, for a Research on the Explosive Pressures of Gases	65	0	0
Prof. J. A. Ewing, for Continuation of Research on the Crystalline Structure of Metals	50	0	0
Dr. Spencer W. Richardson, for Continuation of Research on Magnetic Properties of Alloys of Iron and Aluminium, and Iron and Manganese	15	0	0
Carried forward.....	£570	0	0

Brought forward.....	£570	0
Prof. Ralph Copeland, for Continuation of Observations with Two Bifilar Pendulums	15	0
Joint Permanent Eclipse Committee, for the Purpose of the 1901 Solar Eclipse	500	0
W. A. Shenstone, for a Research on the Methods of Working Rock Crystal or other Forms of Silica in the Oxyhydrogen Flame.....	20	0
F. H. Neville and C. T. Heycock, for Continuation of Work on Alloys	50	0
Seismological Committee of the British Association (per Prof. Judd), to enable the Committee to Establish Instruments to Record Earthquake Tremors	100	0
Joint Antarctic Committee, first instalment of a Grant of £1,000	333	6
Dr. E. P. Perman and G. A. S. Atkinson, for the Determination of the Vapour Density at Various Temperatures of Ammonia and other Dissociable Constants	20	0
Prof. Joly, for a Research on the Physical Properties of the Silicates at Various Pressures and Temperatures	40	0
H. J. H. Fenton, for the Continuation of Researches Arising from the Observation of a New Colour-reaction of Tartaric Acid	100	0
Prof. Japp, for Further Investigation of the Reactions of Ketones, Diketones, and Allied Compounds, and of Derivatives of Amarine and its Analogues	50	0
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1900-1901.

GENERAL FUND.

<i>Cr.</i>	£	s.	d.		<i>Dr.</i>	£	s.	d.
To Appropriations as above	3,681	15	11		By Balance, April 1, 1900	109	14	4
„ Administrative Expenses	200	0	0		„ Parliamentary Grant .	4,000	0	0
„ Transferred to Reserve Fund.....	170	5	11					
„ Balance, Mar. 31, 1901 .	57	12	6					
	<hr/>					<hr/>		
	£4,109 14 4					£4,109 14 4		
	<hr/>					<hr/>		

RESERVE FUND.

<i>Cr.</i>	£	s.	d.		<i>Dr.</i>	£	s.	d.
To Amount over - assigned last year.....	20	7	7		By Transfer from General Fund	170	5	11
„ Balance, March 31, 1901	599	10	9		„ Miscellaneous Receipts, including Repayments	449	12	5
	<hr/>					<hr/>		
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10. All books are returnable to the Library *on the 1st August in each year*, and no books can be borrowed during the month of August.

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- p. Observatoire Royal.
- p. Société Belge de Géologie, de Paléontologie, et d'Hydrologie.
- p. Société Malacologique de Belgique.

Belgium—continued.

Ghent.

AB. Université.

Liège.

AB. Société des Sciences.

p. Société Géologique de Belgique.

Louvain.

B. Laboratoire de Microscopie et de Biologie Cellulaire.

AB. Université.

Canada.

Fredericton, N.B.

p. University of New Brunswick.

Halifax, N.S.

p. Nova Scotian Institute of Science.

Hamilton.

p. Hamilton Association.

Montreal.

AB. McGill University.

p. Natural History Society.

Ottawa.

AB. Geological Survey of Canada.

AB. Royal Society of Canada.

St. John, N.B.

p. Natural History Society.

Toronto.

p. Toronto Astronomical Society.

p. Canadian Institute.

AB. University.

Windsor, N.S.

p. King's College Library.

Cape Colony.

Cape Town.

A. Observatory.

AB. South African Library.

Grahamstown.

p. Public Library.

Ceylon.

Colombo.

B. Museum.

Denmark.

Copenhagen.

AB. Kongelige Danske Videnskabernes Selskab

AB. Bibliothèque Municipale.

England and Wales.

Aberystwith.

AB. University College.

Bangor.

AB. University College of North Wales.

Birmingham.

AB. Central Free Library.

AB. Mason College.

p. Philosophical Society.

Bolton.

p. Public Library.

Bristol.

p. Merchant Venturers' School.

AB. University College.

Cambridge.

AB. Philosophical Society.

p. Union Society.

AB. University Library.

Cardiff.

AB. University College.

Cooper's Hill.

AB. Royal Indian Engineering College.

Dudley

p. Dudley and Midland Geological and Scientific Society.

Essex.

p. Essex Field Club.

Falmouth.

p. Royal Cornwall Polytechnic Society.

Greenwich.

A. Royal Observatory.

Kew.

B. Royal Gardens.

Leeds.

p. Philosophical Society.

AB. Yorkshire College.

Liverpool.

AB. Free Public Library.

p. Literary and Philosophical Society.

A. Observatory.

AB. University College.

London.

AB. Admiralty.

England and Wales—*continued.*

- p.* Anthropological Institute.
- AB. Board of Trade: Electrical Standards Laboratory.
- AB. British Museum.
- AB. British Museum (Nat. Hist.).
- AB. Chemical Society.
- A. City and Guilds of London Institute.
- p.* "Electrician," Editor of the.
- B. Entomological Society.
- AB. Geological Society.
- AB. Geological Survey of Great Britain.
- p.* Geologists' Association.
- AB. Guildhall Library.
- A. Institution of Civil Engineers.
- p.* Institution of Electrical Engineers.
- A. Institution of Mechanical Engineers.
- A. Institution of Naval Architects.
- p.* Iron and Steel Institute.
- AB. King's College.
- AB. King's Library.
- B. Linnean Society.
- AB. London Institution.
- p.* London Library.
- A. Mathematical Society.
- p.* Meteorological Office.
- p.* Odontological Society.
- p.* Pharmaceutical Society.
- p.* Physical Society.
- p.* Quekett Microscopical Club.
- p.* Royal Agricultural Society.
- A. Royal Astronomical Society.
- B. Royal College of Physicians.
- B. Royal College of Surgeons.
- p.* Royal Engineers (for Libraries abroad, six copies).
- AB. Royal Engineers. Head Quarters Library.
- p.* Royal Geographical Society.
- p.* Royal Horticultural Society.
- p.* Royal Institute of British Architects.
- AB. Royal Institution of Great Britain.
- B. Royal Medical and Chirurgical Society.
- p.* Royal Meteorological Society.
- p.* Royal Microscopical Society.
- p.* Royal Statistical Society.
- AB. Royal United Service Institution.
- AB. Society of Arts.

England and Wales—*continued.*

- p.* Society of Biblical Archæology.
- p.* Society of Chemical Industry (London Section).
- p.* Standard Weights and Measures Department.
- AB. University College.
- p.* Victoria Institute.
- AB. War Office.
- B. Zoological Society.

Manchester.

- AB. Free Library.
- AB. Literary and Philosophical Society.
- p.* Geological Society.
- AB. Owens College.

Netley.

- p.* Royal Victoria Hospital.

Newcastle.

- AB. Free Library.
- p.* North of England Institute of Mining and Mechanical Engineers.
- p.* Society of Chemical Industry (Newcastle Section).

Norwich.

- p.* Norfolk and Norwich Literary Institution.

Nottingham.

- AB. Free Public Library.

Oxford.

- p.* Ashmolean Society.
- AB. Bodleian Library.
- AB. Radcliffe Library.
- A. Radcliffe Observatory.

Penzance.

- p.* Geological Society of Cornwall.

Plymouth.

- B. Marine Biological Association.
- p.* Plymouth Institution.

Richmond.

- A. "Kew" Observatory.

Salford.

- p.* Royal Museum and Library.

Stonyhurst.

- p.* The College.

Swansea.

- AB. Royal Institution.

Woolwich.

- AB. Royal Artillery Library.

Finland.

Helsingfors.

p. Societas pro Fauna et Flora Fennica.

AB. Société des Sciences.

France.

Bordeaux.

p. Académie des Sciences.

p. Faculté des Sciences.

p. Société de Médecine et de Chirurgie.

p. Société des Sciences Physiques et Naturelles.

Caen.

Société Linnéenne de Normandie.

Cherbourg.

p. Société des Sciences Naturelles.

Dijon.

p. Académie des Sciences.

Lille.

p. Faculté des Sciences.

Lyons.

AB. Académie des Sciences, Belles-Lettres et Arts.

AB. Université.

Marseille.

AB. Faculté des Sciences.

Montpellier.

AB. Académie des Sciences et Lettres.

B. Faculté de Médecine.

Nantes.

p. Société des Sciences Naturelles de l'Ouest de la France.

Paris.

AB. Académie des Sciences de l'Institut.

p. Association Française pour l'Avancement des Sciences.

p. Bureau des Longitudes.

A. Bureau International des Poids et Mesures.

p. Commission des Annales des Ponts et Chaussées.

p. Conservatoire des Arts et Métiers.

p. Cosmos (M. L'ABBÉ VALETTE).

AB. École des Mines.

AB. École Normale Supérieure.

AB. École Polytechnique.

AB. Faculté des Sciences de la Sorbonne.

B. Institut Pasteur.

AB. Jardin des Plantes.

p. L'Électricien.

A. L'Observatoire.

p. Revue Scientifique (Mons. H. DE VARIGNY).

AB. Service Hydrographique de la Marine.

- AB. Société d'Encouragement pour l'Industrie Nationale.
- AB. Société de Géographie.
- p. Société de Physique.
- B. Société Entomologique.
- AB. Société Géologique.
- p. Société Mathématique.
- p. Société Météorologique de France.

Toulouse.

- AB. Académie des Sciences.
- A. Faculté des Sciences.

Germany.

Berlin.

- A. Deutsche Chemische Gesellschaft.
- A. Die Sternwarte.
- p. Gesellschaft für Erdkunde.
- AB. Königl. Preussische Akademie der Wissenschaften.
- A. Physikalische Gesellschaft.

Bonn.

- AB. Universität.

Bremen.

- p. Naturwissenschaftlicher Verein.

Breslau.

- p. Schlesische Gesellschaft für Vaterländische Kultur.

Brunswick.

- p. Verein für Naturwissenschaft.

Carlsruhe. See Karlsruhe.

Charlottenburg.

- A. Physikalisch-Technische Reichsanstalt.

Danzig.

- AB. Naturforschende Gesellschaft.

Dresden.

- p. Verein für Erdkunde.

Emden.

- p. Naturforschende Gesellschaft.

Erlangen.

- AB. Physikalisch-Medicinische Societät.

Frankfurt-am-Main.

- AB. Senckenbergische Naturforschende Gesellschaft.
- p. Zoologische Gesellschaft.

Frankfurt-am-Oder.

- p. Naturwissenschaftlicher Verein.

Freiburg-im-Breisgau.

- AB. Universität.

Germany—continued.

Giessen.

AB. Grossherzogliche Universität.

Görlitz.

p. Naturforschende Gesellschaft.

Göttingen.

AB. Königliche Gesellschaft der Wissenschaften.

Halle.

AB. Kaiserliche Leopoldino-Carolinische Deutsche Akademie der Naturforscher.

p. Naturwissenschaftlicher Verein für Sachsen und Thüringen.

Hamburg.

p. Naturhistorisches Museum.

AB. Naturwissenschaftlicher Verein.

Heidelberg.

p. Naturhistorisch-Medizinischer Verein.

AB. Universität.

Jena.

AB. Medicinisch-Naturwissenschaftliche Gesellschaft.

Karlsruhe.

A. Grossherzogliche Sternwarte.

p. Technische Hochschule.

Kiel.

p. Naturwissenschaftlicher Verein für Schleswig-Holstein.

A. Astronomische Nachrichten.

AB. Universität.

Königsberg.

AB. Königliche Physikalisch-Ökonomische Gesellschaft.

Leipzig.

p. Annalen der Physik und Chemie.

AB. Königliche Sächsische Gesellschaft der Wissenschaften.

Magdeburg.

p. Naturwissenschaftlicher Verein.

Marburg.

AB. Universität.

Munich.

AB. Königliche Bayerische Akademie der Wissenschaften.

p. Zeitschrift für Biologie.

Münster.

AB. Königliche Theologische und Philosophische Akademie.

Potsdam.

A. Astrophysikalisches Observatorium.

Rostock.

AB. Universität.

AB. Universität.

Tübingen

AB. Universität.

Würzburg.

AB. Physikalisch-Medicinische Gesellschaft.

Greece.

Athens.

A. National Observatory.

Holland. (See NETHERLANDS.)

Hungary.

Buda-pest.

p. Königl. Ungarische Geologische Anstalt.

AB. Á Magyar Tudós Társaság. Die Ungarische Akademie der Wissenschaften.

Hermannstadt.

p. Siebenbürgischer Verein für die Naturwissenschaften.

Klausenburg.

AB. Az Erdélyi Múzeum. Das Siebenbürgische Museum.

Schemnitz.

p. K. Ungarische Berg- und Forst-Akademie.

India.

Bombay.

AB. Elphinstone College.

p. Royal Asiatic Society (Bombay Branch).

Calcutta.

AB. Asiatic Society of Bengal.

AB. Geological Museum.

p. Great Trigonometrical Survey of India.

AB. Indian Museum.

p. The Meteorological Reporter to the Government of India.

Madras.

B. Central Museum.

A. Observatory.

Roorkee.

p. Roorkee College.

Ireland.

Armagh.

A. Observatory.

Ireland—continued.

Belfast.

- AB. Queen's College.

Cork.

- p. Philosophical Society.

- AB. Queen's College.

Dublin.

- A. Observatory.

- AB. National Library of Ireland.

- B. Royal College of Surgeons in Ireland.

- AB. Royal Dublin Society.

- AB. Royal Irish Academy.

- AB. Trinity College.

Galway.

- AB. Queen's College.

Italy.

Acireale.

- p. Accademia di Scienze, Lettere ed Arti.

Bologna.

- AB. Accademia delle Scienze dell' Istituto.

Catania.

- AB. Accademia Gioenia di Scienze Naturali.

Florence.

- p. Biblioteca Nazionale Centrale.

- AB. Museo Botanico.

- p. Reale Istituto di Studi Superiori.

Genoa.

- p. Società Ligustica di Scienze Naturali e Geografiche.

Milan.

- AB. Reale Istituto Lombardo di Scienze, Lettere ed Arti.

- AB. Società Italiana di Scienze Naturali.

Modena.

- p. Le Stazioni Sperimentali Agrarie Italiane.

Naples.

- p. Società di Naturalisti.

- AB. Società Reale, Accademia delle Scienze.

- B. Stazione Zoologica (Dr. DOHRN).

Padua.

- p. University.

Palermo.

- A. Circolo Matematico.

- AB. Consiglio di Perfezionamento (Società di Scienze Naturali ed Economiche).

- A. Reale Osservatorio.

p. Il Nuovo Cimento.

p. Società Toscana di Scienze Naturali.

Rome.

p. Accademia Pontificia de' Nuovi Lincei.

p. Rassegna delle Scienze Geologiche in Italia.

A. Reale Ufficio Centrale di Meteorologia e di Geodinamica,
Collegio Romano.

AB. Reale Accademia dei Lincei.

p. R. Comitato Geologico d' Italia.

A. Specola Vaticana.

AB. Società Italiana delle Scienze.

Siena.

p. Reale Accademia dei Fisiocritici.

Turin.

p. Laboratorio di Fisiologia.

AB. Reale Accademia delle Scienze.

Venice.

p. Ateneo Veneto.

AB. Reale Istituto Veneto di Scienze, Lettere ed Arti.

Japan.

Tokiô.

AB. Imperial University.

p. Asiatic Society of Japan.

Java.

Buitenzorg.

p. Jardin Botanique.

Luxembourg.

Luxembourg.

p. Société des Sciences Naturelles.

Malta.

p. Public Library.

Mauritius.

A. Royal Alfred Observatory.

p. Royal Society of Arts and Sciences.

Netherlands.

Amsterdam.

AB. Koninklijke Akademie van Wetenschappen.

p. K. Zoologisch Genootschap 'Natura Artis Magistra.'

Netherlands—continued.

Haarlem.

AB. Hollandsche Maatschappij der Wetenschappen.

p. Musée Teyler.

Leyden.

AB. University.

Rotterdam.

AB. Bataafsch Genootschap der Proefondervindelijke Wijsgeerte.

Utrecht.

AB. Provinciaal Genootschap van Kunsten en Wetenschappen.

New Zealand.

Wellington.

AB. New Zealand Institute.

Norway.

Bergen.

AB. Bergenske Museum.

Christiania.

AB. Kongelige Norske Frederiks Universitet.

Tromsøe.

p. Museum.

Trondhjem.

AB. Kongelige Norske Videnskabers Selskab.

Portugal.

Coimbra.

AB. Universidade.

Lisbon.

AB. Academia Real das Sciencias.

p. Secção dos Trabalhos Geologicos de Portugal.

Oporto.

p. Annaes de Sciencias Naturaes.

Russia.

Dorpat.

AB. Université.

Irkutsk.

p. Société Impériale Russe de Géographie (Section de Sibérie Orientale).

Kazan.

AB. Imperatorsky Kazansky Universitet.

p. Société Physico-Mathématique.

- p.* Section Médicale de la Société des Sciences Expérimentales.
Université de Kharkow.

Kieff.

- p.* Société des Naturalistes.

Kronstadt.

- p.* Compass Observatory.

Moscow.

- AB.** Le Musée Public.

- B.** Société Impériale des Naturalistes.

Odessa.

- p.* Société des Naturalistes de la Nouvelle-Russie.

Pulkowa.

- A.** Nikolai Haupt-Sternwarte.

St. Petersburg.

- AB.** Académie Impériale des Sciences.

- B.** Archives des Sciences Biologiques.

- AB.** Comité Géologique.

- AB.** Ministère de la Marine.

- A.** Observatoire Physique Central.

Scotland.

Aberdeen.

- AB.** University.

Edinburgh.

- AB.** Advocates' Library.

- p.* Geological Society.

- p.* Royal College of Physicians (Research Laboratory).

- p.* Royal Medical Society.

- A.** Royal Observatory.

- p.* Royal Physical Society.

- p.* Royal Scottish Society of Arts.

- AB.** Royal Society.

Glasgow.

- AB.** Mitchell Free Library.

- p.* Natural History Society.

- p.* Philosophical Society.

Servia.

Belgrade.

- p.* Académie Royale de Serbie.

Spain.

Cadiz.

A. Instituto y Observatorio de Marina de San Fernando.
Madrid.

p. Comisión del Mapa Geológico de España.

AB. Real Academia de Ciencias.

Sweden.

Gottenburg.

AB. Kongl. Vetenskaps och Vitterhets Samhälle.

Lund.

AB. Universitet.

Stockholm.

A. Acta Mathematica.

AB. Kongliga Svenska Vetenskaps-Akademie.

AB. Sveriges Geologiska Undersökning.

Upsala.

AB. Universitet.

Switzerland.

Basel.

p. Naturforschende Gesellschaft.

Bern.

AB. Allg. Schweizerische Gesellschaft.

p. Naturforschende Gesellschaft.

Geneva.

AB. Société de Physique et d'Histoire Naturelle.

AB. Institut National Genevois.

Lausanne.

p. Société Vaudoise des Sciences Naturelles.

Neuchâtel.

p. Société des Sciences Naturelles.

Zürich.

AB. Das Schweizerische Polytechnikum.

p. Naturforschende Gesellschaft.

p. Sternwarte.

Tasmania.

Hobart.

p. Royal Society of Tasmania.

United States.

Albany.

AB. New York State Library.

- AB. Naval Academy.
- Austin.
 - p. Texas Academy of Sciences.
- Baltimore.
 - AB. Johns Hopkins University.
- Berkeley.
 - p. University of California.
- Boston.
 - AB. American Academy of Sciences.
 - B. Boston Society of Natural History.
 - A. Technological Institute.
- Brooklyn.
 - AB. Brooklyn Library.
- Cambridge.
 - AB. Harvard University.
 - B. Museum of Comparative Zoology.
- Chapel Hill (N.C.).
 - p. Elisha Mitchell Scientific Society.
- Charleston.
 - p. Elliott Society of Science and Art of South Carolina.
- Chicago.
 - AB. Academy of Sciences.
 - p. Astrophysical Journal.
 - p. Field Columbian Museum.
 - p. Journal of Comparative Neurology.
 - A. Yerkes' Observatory (University of Chicago).
- Davenport (Iowa).
 - p. Academy of Natural Sciences.
- Ithaca (N.Y.).
 - A. Journal of Physical Chemistry.
 - p. Physical Review (Cornell University).
- Lawrence.
 - p. Kansas University.
- Madison.
 - p. Wisconsin Academy of Sciences.
- Mount Hamilton (California).
 - A. Lick Observatory.
- New Haven (Conn.).
 - AB. American Journal of Science.
 - AB. Connecticut Academy of Arts and Sciences.

United States—*continued.*

New York.

- p.* American Geographical Society.
- p.* American Museum of Natural History.
- A.* American Mathematical Society.
- AB.* Columbia College Library.
- p.* New York Academy of Sciences.
- p.* New York Medical Journal.

Philadelphia.

- AB.* Academy of Natural Sciences.
- AB.* American Philosophical Society.
- p.* Franklin Institute.
- p.* Wagner Free Institute of Science.

Rochester (N.Y.).

- p.* Academy of Science.

St. Louis.

- p.* Academy of Science.

Salem (Mass.).

- p.* American Association for the Advancement of Science.
- AB.* Essex Institute.

San Francisco.

- AB.* California Academy of Sciences.

Washington.

- AB.* Patent Office.
- AB.* Smithsonian Institution.
- AB.* United States Coast Survey.
- B.* United States Commission of Fish and Fisheries.
- AB.* United States Geological Survey.
- AB.* United States Naval Observatory.
- p.* United States Department of Agriculture.
- A.* United States Department of Agriculture (Weather Bureau).

West Point (N.Y.).

- AB.* United States Military Academy.

1. *Exhibited by Mr. J. E. S. Moore, M.A.*
The Tanganyika Problem.
2. *Exhibited by Dr. H. E. Annett and Mr. J. E. Dutton, M.B., of the
School of Tropical Medicine, University College, Liverpool.*
West African Parasitology—
 1. Specimens of some new blood Filariæ.
 2. Specimens illustrating the life history of *Ankylostoma
duodenale* of the Chimpanzee.
3. *Exhibited by Mr. J. Mackenzie Davidson, M.B.*
 1. Stereoscopic Transparencies of Electrical Discharges.
 2. Stereoscopic Skiagrams of Bullet Wounds (taken during South
African War), shown in Wheatstone's Stereoscope.
4. *Exhibited by Mr. Eric S. Bruce, M.A.*
The Meteo-parachute, a new instrument for investigating the
upper atmosphere.
5. *Exhibited by Commander D. Wilson-Barker, R.N.R., F.R.S.E.*
Cloud Photographs.
6. *Exhibited by Professor J. W. Judd, C.B., F.R.S., on behalf of the
Coral-Reef Committee of the Royal Society.*
Specimens of Foraminifera and Ostracoda, from Funafuti, Ellice
Islands.
7. *Exhibited by Mr. H. J. Elwes, F.R.S.*
Reversible Drawers of Butterflies from the Holarctic Region,
arranged to show wide distribution and adaptability to
extremes of climate. Also to show variation, and difficulty
of applying binomial system of nomenclature, with special
reference to Mr. Bernard's recent paper on nomenclature read
before the Linnean Society.
8. *Exhibited by Mr. Killingworth Hedges, M.Inst.C.E.*
Fulgurites, or Lightning Tubes, from the sand hills at
Kensington, N.S.W.

9. *Exhibited by Mr. J. E. Barnard and Dr. Allan Macfadyen.*
Luminous Bacteria (from the Bacteriological Laboratory of Jenner Institute of Preventive Medicine).
10. *Exhibited by Mr. Everard in Thurn, C.B., C.M.G.*
 1. Arrow-heads of Rock Crystals from British Guiana.
 2. Orchids growing wild in British Guiana.
11. *Exhibited by Mr. Vaughan Cornish, M.Sc.*
Photographs of Waves, &c., in Sand, Cloud, and Snow.
12. *Exhibited by Mr. J. Wimshurst, F.R.S.*
Photographs which exhibit some of the properties of the Light emitted by Röntgen Ray Tubes.
13. *Exhibited by Mr. Hugh Ramage.*
Diagrams of corresponding lines in Homologous Spectra.
14. *Exhibited by The Meteorological Office.*
Pilot Charts of the North Atlantic and Mediterranean for April and May, 1901.
15. *Exhibited by the Cambridge Scientific Instrument Company, Limited.*
 1. Callendar and Griffith's Patent Temperature Indicator.
 2. Photographs of the Spectroscope, made for Sir David Gill, use with the McClean Telescope, Royal Observatory, Cape of Good Hope.
16. *Exhibited by The Carl Zeiss Optical Works.*
Stereoscopic Binocular Range-finder.
17. *Exhibited by Professor J. C. Bose.*
Experiments on Binocular Alternation of Vision.
18. *Exhibited by Mr. R. Shelford, B.A.*
Swords and Knives from Sarawak, Borneo.
19. *Exhibited by the Director, British Museum (Natural History).*
 1. Models illustrating the Structure of the Gills of Bivalve Mollusca, prepared under the direction of Prof. E. Lankester, F.R.S.
 2. Examples of Mormyrid Fishes from the Nile.
 3. A series of Adult and Young Birds and Eggs of the Adelia Penguin (*Pygoscelis adeliae*).

- British Museum by Mr. W. E. de Winton, F.Z.S.
5. Claw and Tooth of Neomylodon from Patagonia.
6. Coloured Model of the Right Whale.
20. *Exhibited by Professor A. G. Greenhill, F.R.S.*
1. Reflecting Stereoscope.
2. Trochleostatic Diagram and Models of Pullies.
21. *Exhibited by Mr. C. V. Boys, F.R.S.*
Tool Grinding Appliance.
22. *Exhibited by Dr. Dawson Turner.*
A Mechanical Interrupter for an Induction Coil.
23. *Exhibited by The Marine Biological Association.*
Examples of Marine Plankton from the neighbourhood of Plymouth.
24. *Exhibited by The Observatory, Cambridge.*
Machine for measuring Astronomical Photographs.
25. *Exhibited by Professor Callendar, F.R.S.*
Standard Barometer.
26. *Exhibited by Sir J. Norman Lockyer, K.C.B., F.R.S.*
Photographs of Nova Persei.
27. *Exhibited by The Rev. W. Sidgreaves, S.J.*
Photographs of the Spectrum of Nova Persei.
28. *Exhibited by Mr. Frank McClean, F.R.S.*
Photographic Spectra of Nova Persei.
29. *Exhibited by the Zoological Society of London.*
Living Specimens of the Heloderm (*Heloderma suspectum*) from Arizona, the only venomous Lizard known.
30. *Exhibited by Dr. J. H. Gladstone, F.R.S.*
Ancient Egyptian Gold.
31. *Exhibited by Mr. W. Flinders Petrie, D.C.L.*
1. Casts and Photographs of Egyptian Jewellery of the 1st Dynasty, 4,700 B.C.
2. Specimens of Molecular Transference in Ancient Bronze.

32. *Exhibited by Professor A. W. Rücker, Sec. R.S., and Professor W. Judd, C.B., F.R.S.*

Specimens of Atmospheric Dust which fell at Taormina, Sicily during the month of March, giving rise to the so-called "Blood Rain."

33. *Exhibited by Sir W. Roberts-Austen, K.C.B., F.R.S.*

Masses of Chromium, Manganese, Ferro-titanium and Cobalt.

34. *Exhibited by Dr. P. L. Selater F.R.S.*

Two Bandoliers, from the Semliki Forest, Congo Free State, made from the skin of a new Mammal.

35. *Exhibited by Dr. H. Woodward, F.R.S.*

1. Coloured Casts of Objects of Natural History, prepared at British Museum (Natural History).
2. Enlarged Model of the Shell of *Ascoceras*, a Cephalopod occurring in the Silurian Rocks of England, Sweden, North America.
3. Table of British Strata, Coloured.

36. *Exhibited by Mr. G. Abbott, M.R.C.S.*

1. "Growth" in Inorganic Matter.
2. Symmetrical Concretions.

37. *Exhibited by Hon. Walter Rothschild, M.P.*

Leg Bones and Egg of *Æpyornis titan*, Madagascar.

38. *Exhibited by Mr. W. Duddell.*

The Musical Arc.

39. *Exhibited by The Telegraphone Syndicate.*

The Telegraphone.

- 40.* *Exhibited by Dr. Arthur Rowe, F.G.S.*

Life-zones in the White Chalk, and their significance in connection with the evolution of species.

- 41.* *Exhibited by Mr. Francis Fox, Mem.Inst.C.E.*

Some Engineering Problems and their Solution.

- 42.* *Exhibited by Professor Silvanus P. Thompson, F.R.S.*

Kinematograph Diagrams, illustrating Magnetic Fields.

LIST OF LECTURERS AND SUBJECTS.

1738. Alexander Stuart.
 "On the Motion of the Heart, founded on some Anatomical
 Observations and Experiments."
 Phil. Trans., Vol. 40, Supplement; Vol. 41, p. 675.
1739. Frank Nicholls.
 "An Enquiry into Muscular Motion."
 Journal Book, Vol. XVIII. p. 70.
1740. Alexander Stuart.
 "On the Peristaltic Motion of the Intestines."
 Journal Book, Vol. XVIII. p. 227—9.
1740. Alexander Stuart.
 "Microscopical Observations on several parts of live Frogs."
 Journal Book, Vol. XVIII. p. 290.
1741. James Douglas.
 "Description of the several Muscles, Membranes and parts
 belonging to the Uvula of the Palate, and concerned in its
 action; as also of the several parts subservient to the uses
 of the Tuba Eustachiana."
 Journal Book, Vol. XVIII. p. 377.
1742. James Douglas.
 "Description and Structure of the Human Bladder, with
 the Uses of its Muscles and Membranes."
 Journal Book, Vol. XVIII. p. 419.
- 1744.* James Parsons.
 "An Introductory Discourse on Muscular Motion."
 Phil. Trans., Vol. 43, Supplement.
1745. James Parsons.
 "On Muscular Motion." Phil. Trans., Vol. 43, Supplement.
1746. James Parsons.
 "Description of the several Muscles of the Face; with their
 particular Functions and Uses."
 Phil. Trans., Vol. 44, Part I., Supplement.

* Lecture revived, "the deficiency of the Fund being made good by the Rents."

1747. Browne Langrish.
 "On the Theory of Muscular Motion."
 Phil. Trans., Vol. 44, Part II., Suppl.
1750. James Parsons.
 "On Muscular Motion." Journal Book, Vol. XXI.
1751. James Parsons.
 "Critical Remarks upon the Motion and Uses of the Pelvis."
 Journal Book, Vol. XXI. pp. 64
- 1752 and 1753. Not recorded.
- 1754 to 1758. Charles Morton.
 Minutes of Council, Vol. IV. pp. 168
 and Annual Accounts.
- 1759 and 1760. Not recorded.
1761. Charles Morton. (?)
 Annual Accounts.
- 1762 to 1774. Not recorded.
- 1775 and 1776. John Hunter.
 Minutes of Council, Vol. VI. pp. 28
- 1777 to 1781. John Hunter.
 "On the Construction and Application of Muscles and
 Power by which they are actuated."
 Journal Book, Vol. XXXI. pp. 1
 and Annual Accounts.
1782. John Hunter.
 "On the Density and Firmness of a Muscle as contributing
 to its Strength and Agility."
 Journal Book, Vol. XXXI.
1783. Not recorded.
1784. Foart Simmons.
 "On the Irritability of the Muscular Fibres."
 Journal Book, Vol. XXXI.
1785. Edward Whittaker Grey.
 "An Examination into Haller's Theory of Muscular Motion."
 Journal Book, Vol. XXXII.
1786. Edward Whittaker Grey.
 "On the Effects of different kinds of Salts applied as Stimuli
 on the Muscles."
 Journal Book, Vol. XXXII.
1787. George Fordyce.
 "On Muscular Motion." Phil. Trans., Vol. 78.

1789. Sir William Blizard.
 "On the Theory of Muscular Motion."
 Journal Book, Vol. XXXIV. p. 9.
1790. Sir Everard Home, Bart.
 "On the Mechanism employed in producing Muscular Motion."
 Journal Book, Vol. XXXIV. p. 200.
1791. Matthew Baillie.
 "A general view of the Nature of the Muscles, and an enumeration of the most striking facts connected with the Theory of their Motion."
 Journal Book, Vol. XXXIV. p. 419.
1792. Not recorded.
1793. Sir Everard Home, Bart.*
 "On Mr. Hunter's Experiments to ascertain whether the Crystalline Humour of the Eye be muscular."
 Journal Book, Vol. XXXV. p. 166.
1794. Sir Everard Home, Bart.
 "On the Crystalline Humour of the Eye." Phil. Trans. 1795.
1795. Sir Everard Home, Bart.
 "On the Mechanism employed in producing Muscular Motion."
 Phil. Trans. 1795.
1796. Sir Everard Home, Bart.
 "On the Crystalline Humour of the Eye." Phil. Trans. 1796.
1797. John Abernethy.
 "A general Review of the latest Opinions relative to Animal Life and Motion." Journal Book, Vol. XXXVI. p. 340.
1798. Sir Everard Home, Bart.
 "Experiments and Observations upon the Structure of Nerves."
 Phil. Trans. 1799.
1799. Sir Everard Home, Bart.
 "On the Structure and Uses of the Membrana Tympani."
 Phil. Trans. 1800.
1800. Sir Everard Home, Bart.
 "On the Irritability of Nerves." Phil. Trans. 1801.

* The decease of Mr. Hunter took place before the Lecture, on which he was engaged by appointment of the Council, was completed.

1801. Sir Everard Home, Bart.
"On the power of the Eye to adjust itself to different distances when deprived of the Crystalline Lens."
Phil. Trans.
1802. Not recorded.
1803. John Pearson.
"On Muscular Motion."
Journal Book, Vol. XXXVIII. p.
1804. Sir Anthony Carlisle.
"On Muscular Motion."
Phil. Trans.
1805. Sir Anthony Carlisle.
"On the Arrangement and Mechanical Action of the Muscles of Fishes."
Phil. Trans.
1806. John Pearson.
"Remarks on Muscular Power, and on some of the circumstances by which it is increased, diminished, or finally abolished."
Journal Book, Vol. XXXIX. p.
1807. Sir Anthony Carlisle.
"On the Natural History and Chemical Analysis of the Muscles, and the circumstances which constitute the Muscles of Animals."
Journal Book, Vol. XXXIX. p.
1808. Thomas Young.
"On the Functions of the Heart and Arteries."
Phil. Trans.
1809. William Hyde Wollaston.
"Observations on the Mode of Action of Voluntary Muscles, and on the causes which derange, and assist, the Action of the Heart and Blood Vessels."
Phil. Trans.
1810. Benjamin Collins Brodie.
"Physiological Researches, respecting the Influence of the Brain on the Action of the Heart, and on the Generation of Animal Heat."
Phil. Trans.
- 1811 and 1812. Not recorded.
1813. Benjamin Collins Brodie.
"On the Influence of the Nervous System on the Action of the Muscles in general and of the Heart in particular."
Journal Book, Vol. XII. p.
- 1814 to 1816. Not recorded.
1817. Sir Everard Home, Bart.
"On the Changes the Blood undergoes in the act of Coagulation."
Phil. Trans.

1819. Sir Everard Home, Bart.
 "A further Investigation of the component parts of the Blood."
 Phil. Trans. 1820.
1820. Sir Everard Home, Bart.
 "Microscopical Observations on the following subjects:—On the Brain and Nerves; showing that the Materials of which they are composed exist in the Blood; on the Discovery of Valves in the branches of the *vas breve*, lying between the villous and muscular coats of the Stomach; on the Structure of the Spleen."
 Phil. Trans. 1821.
1821. Sir Everard Home, Bart.
 "On the Anatomical Structure of the Eye; illustrated by Microscopical Drawings, executed by F. Bauer."
 Phil. Trans. 1822.
1822. Francis Bauer.
 "Microscopical Observations on the Suspension of the Muscular Motions of the Vibrio Tritici."
 Phil. Trans. 1823.
1823. Sir Everard Home, Bart.
 "On the Internal Structure of the Human Brain, when examined in the Microscope, as compared with that of Fishes, Insects and Worms."
 Phil. Trans. 1824.
1824. Sir Everard Home, Bart.
 "On the existence of Nerves in the Placenta."
 Phil. Trans. 1825.
1825. Sir Everard Home, Bart.
 "On the Structure of a Muscular Fibre from which are derived its Elongation and Contraction."
 Phil. Trans. 1826.
1826. Sir Everard Home, Bart.
 "An Enquiry into the mode by which the Propagation of the Species is carried on, in the Common Oyster, and in the large Fresh-water Muscle."
 Phil. Trans. 1827.
1827. Sir Everard Home, Bart.
 "On the Muscles peculiar to Organs of Sense in particular Quadrupeds and Fishes."
 Journal Book, Vol. XLV. p. 143.
1828. Not appointed.
1829. Sir Everard Home, Bart.
 "A Report on the Peculiarities met with in the Stomach of the Zariffa."
 Journal Book, Vol. XLV. p. 580.

1830 to 1856. Not appointed.

1857. James Paget.

"On the Cause of the Rhythmic Action of the Heart."
Proceedings, V

1858. Thomas Henry Huxley.

"On the Theory of the Vertebrate Skull." Proceedings, V

1859. Not appointed.

1860. James Bell Pettigrew.

"On the Arrangement of the Muscular Fibres of the V
cular Portion of the Heart of the Mammal."
Proceedings, V
Phil. Trans., 18

1861. Charles Édouard Brown-Séquard.

"On the Relations between Muscular Irritability, Cad
Rigidity, and Putrefaction." Proceedings, V

1862. Albert Kölliker.

"On the Termination of Nerves in Muscles, as observed i
Frog: and on the disposition of the Nerves in the
Heart."
Proceedings, V

1863. Joseph Lister.

"On the Coagulation of the Blood." Proceedings, V

1864. Hermann Helmholtz.

"On the Normal Motions of the Human Eye in relat
Binocular Vision." Proceedings, V

1865. Lionel S. Beale.

"On the ultimate Nerve-fibres distributed to Muscle and
other Tissues, with Observations upon the Structur
probable Mode of Action of a Nervous Mechanism."
Proceedings, V

1866. Not appointed.

1867. J. S. Burdon-Sanderson.

"On the Influence exercised by the Movements of Resp
on the Circulation of the Blood." Phil. Trans., V

1868. Not appointed.

1869. Not appointed.

1870. Augustus V. Waller.

"On the Results of the Method, introduced by the A
of investigating the Nervous System, more especia
applied to the Elucidation of the Functions of the Pr
gastric and Sympathetic Nerves in Man."
Proceedings, V

1871 and 1872. Not appointed.

1874. David Ferrier.
 "The Localization of Function in the Brain."
 Proceedings, Vol. 22 (Abstr.).
1875. David Ferrier.
 "Experiments on the Brain of Monkeys. Second Series."
 Phil. Trans. 1875.
1876. G. J. Romanes.
 "Preliminary Observations on the Locomotor System of
 Medusæ."
 Phil. Trans. 1876.
1877. J. S. Burdon-Sanderson and F. J. M. Page.
 "On the Mechanical Effects, and on the Electrical Disturb-
 ance, consequent on Excitation of the Leaf of *Dionæa*
muscipula."
 Proceedings, Vol. 25.
1878. H. N. Moseley.
 "On the Structure of the Stylasteridæ: a Family of the
 Hydroid Stony Corals."
 Phil. Trans. 1878.
1879. W. K. Parker.
 "On the Structure and Development of the Skull in the
 Lacertilia. Part I. On the Skull of the Common Lizards
 (*Lacerta agilis*, *L. viridis*, and *Zootoca vivipara*)."
 Phil. Trans., 1879.
1880. Rev. S. Haughton.
 "On some Elementary Principles in Animal Mechanics, No. IX.
 The Relation between the Maximum Work done, the Time
 of Lifting, and the Weights lifted by the Arms."
 Proceedings, Vol. 30.
1881. G. J. Romanes and J. C. Ewart.
 "Observations on the Locomotor System of Medusæ."
 Phil. Trans. 1881.
1882. W. H. Gaskell.
 "On the Rhythm of the Heart of the Frog, and on the Nature
 of the Action of the Vagus Nerve."
 Phil. Trans. 1882.
1883. H. N. Martin.
 "On the Direct Influence of Gradual Variations of Temperature
 upon the Rate of Beat of the Dog's Heart."
 Phil. Trans. 1883.
- 1884 and 1885. Not appointed.
1886. L. C. Wooldridge.
 "The Coagulation of the Blood."
 Proceedings, Vol. 40.

1887. H. G. Seeley.
"On *Pareiasaurus bombidens* (Owen) and the Significance
its Affinities to Amphibians, Reptiles, and Mammals.
Phil. Trans. B,
1888. W. Kühne (Heidelberg).
"Ueber die Entstehung der Vitalen Bewegung,"
Proceedings, Vol.
1889. Dr. Roux (Institut Pasteur).
"Les Inoculations Préventives." Proceedings, Vol.
1890. H. Marshall Ward.
"The Relations between Host and Parasite in certain Epiphytic
Diseases of Plants." Proceedings, Vol.
1891. Francis Gotch and Victor Horsley.
"On the Mammalian Nervous System; its Functions and
Localisation determined by an Electrical Method."
Phil. Trans., B, Vol.
1892. Angelo Mosso (Turin).
"Les Phénomènes psychiques et la Température du Cerveau."
Phil. Trans., B, Vol.
1893. Rudolf Virchow (Berlin).
"The Position of Pathology among Biological Studies."
Proceedings, Vol.
1894. S. Ramón y Cajal (Madrid).
"La fine Structure des Centres Nerveux." Proceedings, Vol.
1895. T. W. Engelmann (Utrecht).
"On the Nature of Muscular Contraction."
Proceedings, Vol.
1896. Augustus D. Waller.
"Observations on Isolated Nerve." Proceedings, Vol.
1897. Charles S. Sherrington.
"The Mammalian Spinal Cord as an Organ of Reflex Action."
Phil. Trans.; B, Vol.
1898. Wilhelm Pfeffer (Leipzig).
"The Nature and Significance of Functional Metabolism in
Plant." Proceedings, Vol.
1899. J. S. Burdon Sanderson.
"On the Relation of Motion in Animals and Plants to
Electrical Phenomena which are associated with it."
Proceedings, Vol.
1900. Paul Ehrlich (Frankfort-on-M.).
"On Immunity with Special Reference to Cell Life."
Proceedings, Vol.
1901. C. Lloyd Morgan.
"Studies in Signal Sensation."
Proceedings, Vol.

LIST OF LECTURERS AND SUBJECTS.

1775. Peter Woulfe.

"Experiments made in order to ascertain the nature of some Mineral Substances, and in particular to see how far the Acids of Sea-Salt and of Vitriol contribute to Mineralize Metallic and other Substances."—Part I.

Journal Book, Vol. XXIX. p. 135.

1776 and 1777. Peter Woulfe.

1778. John Ingen-Housz.

"Electrical Experiments to explain how far the Phenomena of the Electrophorus may be accounted for by Dr. Franklin's Theory of Positive and Negative Electricity."

Phil. Trans., Vol. 68.

1779. John Ingen-Housz.

"Improvements in Electricity."

Phil. Trans., Vol. 69.

1780. Tiberius Cavallo.

"Thermometrical Experiments and Observations."

Phil. Trans., Vol. 70.

1781. Tiberius Cavallo.

"An Account of some Thermometrical Experiments."

Phil. Trans., Vol. 71.

1782. Tiberius Cavallo.

"An Account of some Experiments relating to the Property of Common and Inflammable Airs of pervading the Pores of Paper."

Journal Book, Vol. XXXI. p. 203.

1783. Tiberius Cavallo.

"Description of an improved Air Pump."

Journal Book, Vol. XXXI. p. 401.

1784. Tiberius Cavallo.

"An Account of some Experiments made with the new improved Air Pump."

Journal Book, Vol. XXXI. p. 631.

1785. Tiberius Cavallo.

"Magnetical Experiments and Observations."

Phil. Trans., Vol. 76.

1786. Tiberius Cavallo.
"Magnetical Experiments and Observations."
Phil. Trans.,
1787. Tiberius Cavallo.
"Of the Methods of manifesting the Presence, and ascer-
the Quality, of small Quantities of Natural or A
Electricity."
Phil. Trans.,
1788. Tiberius Cavallo.
"On an Improvement in the Blow Pipe."
Journal Book, Vol. XXXIII.
1789. Tiberius Cavallo.
"Magnetical Experiments and Observations."
Journal Book, Vol. XXXI
1790. Tiberius Cavallo.
"A Description of a new Pyrometer."
Journal Book, Vol. XXXIV
1791. Tiberius Cavallo.
"On the Method of Measuring Distances by means of Te
furnished with Micrometers."
Journal Book, Vol. XXXIV
1792. Tiberius Cavallo.
"An Account of the Discoveries concerning Muscular
which have been lately made, and are commonly kn
the name of Animal Electricity."
Journal Book, Vol. XXXIV
1793. George Fordyce.
"An Account of a New Pendulum."
Phil. Tra
1794. Samuel Vince.
"Observations on the Theory of the Motion and Resi
Fluids; with a Description of the Construction of
ments, in order to obtain some fundamental Princip
Phil. Tra
- 1795 and 1796. Samuel Vince. (?)
1797. Samuel Vince.
"Experiments upon the Resistance of Bodies moving in
Phil. Tra
1798. Samuel Vince.
"Observations upon an unusual Horizontal Refracti
Air; with Remarks on the Variations to which
Parts of the Atmosphere are sometimes subject."
Phil. Tra

1801. Thomas Young.
 "On the Theory of Light and Colours." Phil. Trans. 1802.
1802. William Hyde Wollaston.
 "Observations on the Quantity of Horizontal Refraction; with
 Method of measuring the Dip at Sea." Phil. Trans. 1803.
1803. Thomas Young.
 "Experiments and Calculations relative to Physical Optics."
 Phil. Trans. 1804.
1804. Samuel Vince.
 "Observations on the Hypotheses which have been assumed to
 account for the cause of Gravitation from Mechanical
 Principles." Journal Book, Vol. XXXVIII. p. 334.
1805. William Hyde Wollaston.
 "On the Force of Percussion." Phil. Trans. 1806.
1806. Sir Humphry Davy, Bart.
 "On some Chemical Agencies of Electricity." Phil. Trans. 1807.
1807. Sir Humphry Davy, Bart.
 "On some new Phenomena of Chemical Changes produced by
 Electricity, particularly the Decomposition of the fixed
 Alkalies, and the Exhibition of the new Substances which
 constitute their Bases." Phil. Trans. 1808.
1808. Sir Humphry Davy, Bart.
 "An Account of some new Analytical Researches on the Nature
 of certain Bodies, particularly the Alkalies, Phosphorus,
 Sulphur, Carbonaceous Matter, and the Acids hitherto
 undecomposed; with some general Observations on
 Chemical Theory." Phil. Trans. 1809, pp. 39, 450.
1809. Sir Humphry Davy, Bart.
 "On some new Electro-Chemical Researches, on various objects,
 particularly the Metallic Bodies from the Alkalies and
 Earths; and on some Combinations of Hydrogen."
 Phil. Trans. 1810.
1810. Sir Humphry Davy, Bart.
 "On some of the Combinations of Oxymuriatic Gas and
 Oxygen, and on the Chemical Relations of these Principles
 to Inflammable Bodies." Phil. Trans. 1811.
1811. Sir Humphry Davy, Bart. (?)
1812. William Hyde Wollaston.
 "On the Elementary Particles of certain Crystals."
 Phil. Trans. 1813

1813. William Thomas Brande.

"On some new Electro-Chemical Phenomena."

Phil. Trans. 18

1814 to 1818. No record.

1819. William Thomas Brande.

"On the Composition and Analysis of the inflammable Gaseous Compounds resulting from the destructive Distillation of Coal and Oil; with some Remarks on their relative heating and illuminating power."

Phil. Trans. 18

1820. Captain Henry Kater.

"On the best kind of Steel, and form, for a Compass Needle."

Phil. Trans. 18

1821. Captain Edward Sabine.

"An Account of Experiments to determine the Amount of Dip of the Magnetic Needle in London, in August 1821, with Remarks on the Instruments which are usually employed in such determinations."

Phil. Trans. 18

1822. No record.

1823. John F. W. Herschel.

"On certain Motions produced in Fluid Conductors by transmitting the Electric Current."

Phil. Trans. 18

1824 to 1825. No record.

1826. Sir. Humphry Davy, Bart.

"On the Relations of Electrical and Chemical Changes."

Phil. Trans. 18

1827. George Pearson.

"Researches to discover the Faculties of Pulmonary Absorption with respect to Charcoal."

Journal Book, Vol. XLV. p.

1828. William Hyde Wollaston.

"On a Method of rendering Platina malleable."

Phil. Trans. 18

1829. Michael Faraday.

"On the Manufacture of Glass for Optical Purposes."

Phil. Trans. 18

1830. No record.

1831. No record.

1832. Michael Faraday.

"Experimental Researches in Electricity; Second Series."

1834. Not appointed.
1835. Charles Lyell.
"On the Proofs of a gradual Rising of the Land in certain parts of Sweden." Phil. Trans. 1835.
1836. John William Lubbock.
"On the Tides of the Port of London." Phil. Trans. 1836.
1837. William Henry Fox Talbot.
"Further Observations on the Optical Phenomena of Crystals." Phil. Trans. 1837.
1838. James Ivory.
"On the Theory of the Astronomical Refractions." Phil. Trans. 1838.
1839. William Snow Harris.
"Inquiries concerning the Elementary Laws of Electricity." Phil. Trans. 1839.
1840. George Biddell Airy.
"On the Theoretical Explanation of an apparent new Polarity of Light." Phil. Trans. 1840.
1841. George Newport.
"On the Organs of Reproduction and the Development of the Myriapoda." Phil. Trans. 1841.
1842. James David Forbes.
"On the Transparency of the Atmosphere and the Law of Extinction of the Solar Rays in passing through it." Phil. Trans. 1842.
1843. Charles Wheatstone.
"An Account of several new Instruments and Processes for determining the Constants of a Voltaic Circuit." Phil. Trans. 1843.
1844. Richard Owen.
"A Description of certain Belemnites, preserved, with a great proportion of their soft parts, in the Oxford Clay, at Christian-Malford, Wilts." Phil. Trans. 1844.
1845. Charles Giles Bridle Daubeny.
"Memoir on the Rotation of Crops, and on the Quantity of Inorganic Matters abstracted from the Soil by various Plants under different circumstances." Phil. Trans. 1845.

1846. James David Forbes.
"Illustrations of the Viscous Theory of Glacier Motion."
Phil. Trans. 1
1847. William Robert Grove.
"On certain Phenomena of Voltaic Ignition and the Decomposition of Water into its constituent Gases by Heat."
Phil. Trans. 1
1848. Rev. William Whewell.
"Researches on the Tides." Thirteenth Series. On the Tides of the Pacific, and on the Diurnal Inequality.
Phil. Trans. 1
1849. Michael Faraday.
"Experimental Researches in Electricity." Twenty-Series.
Phil. Trans. 1
1850. Thomas Graham.
"On the Diffusion of Liquids."
Phil. Trans.
1851. Michael Faraday.
"Experimental Researches in Electricity." Twenty-Series.
Phil. Trans.
1852. Charles Wheatstone.
"Contributions to the Physiology of Vision. Part II. On some remarkable and hitherto unobserved Phenomena of Binocular Vision (continued)."
Phil. Trans.
1853. Col. Edward Sabine.
"On the Influence of the Moon on the Magnetic Declination at Toronto, St. Helena, and Hobarton."
Phil. Trans.
1854. Thomas Graham.
"On Osmotic Force."
Phil. Trans.
1855. John Tyndall.
"On the Nature of the Force by which Bodies are repelled from the Poles of a Magnet; to which is prefixed an account of some experiments on Molecular Influences."
Phil. Trans.
1856. William Thomson.
"On the Electrodynamic Qualities of Metals."
Phil. Trans.
1857. Michael Faraday.
"Experimental Relations of Gold (and other metals) to Light."
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1858. John Peter Gassiot.
"On the Stratifications and Dark Band in Electrical Discharges."
Phil. Trans.

1860. William Fairbairn.

"Experimental Researches to determine the Density of Steam at different Temperatures, and to determine the Law of Superheated Steam." Phil. Trans. 1860.

1861. John Tyndall.

"On the Absorption and Radiation of Heat by Gases and Vapours, and on the Physical Connection of Radiation, Absorption and Conduction." Phil. Trans. 1861.

1862. Warren De La Rue.

"On the Total Solar Eclipse of July 18, 1860, observed at Rivabellosa, near Miranda de Ebro, in Spain." Phil. Trans. 1862.

1863. Henry Clifton Sorby.

"On the Direct Correlation of Mechanical and Chemical Forces." Proceedings, Vol. 12, 1863.

1864. John Tyndall.

"Contributions to Molecular Physics: being the Fifth Memoir of Researches on Radiant Heat." Phil. Trans. 1864.

1865. Henry Enfield Roscoe.

"On a Method of Meteorological Registration of the Chemical Action of Total Daylight." Phil. Trans. 1865.

1866. James Clerk Maxwell.

"On the Viscosity or Internal Friction of Air and other Gases." Phil. Trans. 1866.

1867. Frederick Augustus Abel.

"Researches on Gun-Cotton. (Second Memoir.) On the Stability of Gun-Cotton." Phil. Trans. 1867.

1868. Henry Enfield Roscoe.

"Researches on Vanadium." Phil. Trans. 1868.

1869. Thomas Andrews.

"The Continuity of the Gaseous and Liquid States of Matter." Phil. Trans. 1869.

1870. John William Dawson.

"On the Pre-Carboniferous Flora of North Eastern America, and more especially on that of the Erian (Devonian) Period." Proceedings, Vol. 18.

1871. Charles William Siemens.
"On the Increase of Electrical Resistance in Conductors with the Rise of Temperature, and its Application to the Measurement of Ordinary and Furnace Temperatures: also on a simple Method of measuring Electrical Resistances."
Proceedings, Vol.
1872. William Kitchen Parker.
"On the Structure and Development of the Skull of the Salmon (*Salmo salar*, L.)."
Proceedings, Vol.
1873. Earl of Rosse.
"On the Radiation of Heat from the Moon, the Law of Absorption by our Atmosphere, and its variation in Amount with her Phases."
Proceedings, Vol.
1874. J. Norman Lockyer.
"Researches in Spectrum Analysis in connection with the Spectrum of the Sun." Part III. Phil. Trans. 1
1875. William Grylls Adams.
"On the Forms of Equipotential Curves and Surfaces and Lines of Flow."
Proceedings, Vol.
1876. Thomas Andrews.
"On the Gaseous State of Matter." Proceedings, Vol.
1877. William Crawford Williamson.
"On the Organization of the Fossil Plants of the Mesozoic Measures." Part IX. Phil. Trans.
1878. William Crookes.
"On Repulsion resulting from Radiation. Part V." Phil. Trans.
1879. William Crookes.
"On the Illumination of Lines of Molecular Pressure and Trajectory of Molecules." Phil. Trans.
1880. Captain William de W. Abney.
"On the Photographic Method of Mapping the least refrangible end of the Solar Spectrum." Phil. Trans.
1881. John Tyndall.
"Action of free Molecules on Radiant Heat, and its conversion thereby into sound." Phil. Trans.
1882. Heinrich Debus.
"On the Chemical Theory of Gunpowder." Phil. Trans.
1883. William Crookes.
"On Radiant Matter Spectroscopy: the Detection and

1885. William Huggins.
"On the Corona of the Sun." Proceedings, Vol. 39.
1886. Captain William de W. Abney and Major-General Edward Robert Festing.
"Colour Photometry." Phil. Trans. 1836.
1887. Joseph John Thomson.
"On the Dissociation of some Gases by the Electric Discharge"
Proceedings, Vol. 42 (Abstract).
1888. J. Norman Lockyer.
"Suggestions on the Classification of the various Species of
Heavenly Bodies. A Report to the Solar Physics Com-
mittee." Proceedings, Vol. 44.
1889. Arthur William Rücker and Thomas Edward Thorpe.
"A Magnetic Survey of the British Isles for the Epoch
January 1, 1886." Phil. Trans. A, Vol. 181.
1890. Arthur Schuster.
"The Discharge of Electricity through Gases. Preliminary
Communication." Proceedings, Vol. 47.
1891. George Howard Darwin.
"On Tidal Prediction." Phil. Trans. A., Vol. 182.
1892. James Thomson.
"On the Grand Currents of Atmospheric Circulation."
Phil. Trans. A., Vol. 183.
1893. Harold B. Dixon.
"The Rate of Explosion in Gases." Phil. Trans. A., Vol. 184.
1894. Thomas Edward Thorpe and J. W. Rodger.
"On the Relations between the Viscosity (internal friction) of
Liquids and their Chemical Nature." Phil. Trans. A., Vol. 185.
1895. A. G. Vernon Harcourt and William Esson.
"On the Laws of Connexion between the Conditions of a
Chemical Change and its Amount. III. Further Researches
on the Reaction of Hydrogen Dioxide and Hydrogen
Iodide." Phil. Trans., A., 1895.
1896. William Chandler Roberts-Austen.
"On the Diffusion of Metals." Phil. Trans. A. 1896.

1897. Osborne Reynolds and W. H. Moorby.
"On the Mechanical Equivalent of Heat."
Phil. Trans., A., Vol.
1898. William James Russell.
"Further Experiments on the Action exerted by certain Metals
and other Bodies on a Photographic Plate."
Proceedings, Vol.
1899. James Alfred Ewing and W. Rosenhain.
"The Crystalline Structure of Metals."
Phil. Trans., A., Vol.
1900. William Augustus Tilden.
"On the Specific Heat of Metals and the Relation of Specific
Heat to Atomic Weight."
Phil. Trans., A., Vol.
1901. James Dewar.
"The Nadir of Temperature and Allied Problems."
Proceedings, Vol.
-

AWARD OF MEDALS, 1901.

The Copley Medal to Prof. J. Willard Gibbs, For. Mem. R.S., for his contributions to Mathematical Physics.

A Royal Medal to Prof. W. E. Ayrton, F.R.S., for his contributions to Electrical Science.

A Royal Medal to Dr. W. T. Blanford, F.R.S., for his work in connection with the Geographical Distribution of Animals.

The Davy Medal to Prof. G. D. Liveing, F.R.S., for his contributions to Spectroscopy.

The Sylvester Medal to Prof. H. Poincaré, For. Mem. R.S., for his contributions to Mathematical Science.

STUDENTSHIPS.

The Joule Studentship is held by Dr. Ulrich Behn, in Berlin, for a research to establish a direct connection between the measurements of Ice Calorimetry and Water Calorimetry.

The Mackinnon Studentship is held by Mr. J. J. R. Macleod, M.B., for researches in Pathological Chemistry.

ANNIVERSARY MEETING.

1901.

On Saturday, November 30, being St. Andrew's Day, the Anniversary Meeting of the Society was held in their apartment at Burlington House.

SIR WM. HUGGINS, K.C.B., D.C.L., LL.D., President, in the Chair.

The Report of the Auditors was presented as follows:—

“During the past year, the total Ordinary Receipts on General Purposes Account, including the Treasury Grant of £1,000 for Publications, amount to £7,517 12s. 1d.

“The total Ordinary Expenditure for the same period on General Purposes, including grants for Publications, amounts to £7,811 10s. 9d. showing an excess of Expenditure over Income of £293 18s. 9d.

“The Assets of the Society on the General Purposes Account amount to £2,698 6s. 11d., against which there are liabilities amounting to £2,790 15s. 4d., leaving a balance to the debit of the Account of £92 8s. 5d.

“The Trust Funds Accounts show a balance of Receipts and Expenditure amounting to £5,401 3s. 8d., of which £3,058 5s. 8d. is on the General Trust Funds Accounts, and £2,342 18s. 4d. on the Account of the National Physical Laboratory.”

The thanks of the Society were voted to the Treasurer and Auditors.

The Secretary read the lists of Fellows elected and deceased at the last Anniversary. (*See pp. 41 and 184.*)

The following Report of the Council, which had been previously distributed to the Fellows, having been taken as read, was, on the motion of the President, received:—

Since the last presentation of the Council's Annual Report to the Fellows, the Royal Society has suffered the loss of its beloved Patron, Queen Victoria, of blessed memory. The Council of the Society took a suitable occasion for presenting to His Majesty King Edward their dutiful condolences and homage. A deputation was graciously received by the King, and presented to him an Address which had been previously adopted at a meeting of the Society. His Majesty, in the course of his reply, was pleased to signify his willingness to accept the position of Patron of the Society, and subsequently inscribed his name as such in the Charter Book. The King has also been pleased to continue the annual gift of the Royal medals founded by His Majesty King George IV.

British Academy.

In the last Report it was stated that the Council had agreed to leave the consideration of the Report of the British Academy Committee, without recording any opinion, to the succeeding Council. The present Council resolved to call a Special Meeting of the Fellows, in order that they might have an opportunity of hearing their views, without taking any vote, on the questions raised in the Report. A meeting was accordingly held on May 9th, and a number of Fellows took part in a very interesting discussion. The Report having again come before the Council at its last Meeting in the summer, it was, after full consideration, resolved "that the Council, while sympathising with the desire to secure corporate organisation for the exact literary studies considered in the Report, is of opinion that it is undesirable that the Royal Society should itself initiate the establishment of a British Academy."

The Report of the Committee is printed as an appendix to this Report.

Antarctic.

Preparations for the Expedition were diligently carried on during the past year, the Special Committees referred to in the last Report having devoted much time and trouble to settling the many details necessarily involved in so great and important an undertaking, and the Expedition was able to sail in August.

The labours of the Joint Committee of the Royal and Royal Geographical Societies were largely devoted to considering the

Instructions to the Commander of the Expedition and to the Director of the Civilian Scientific Staff drawn up by the Executive Committee.

The Council were led to understand that the Joint Committee, coming to a decision upon these Instructions, had met with great difficulties, on account of the conflicting views which prevailed among members of the Committee in respect of the relative importance of the several objects to be gained by the Expedition and the best way of securing those objects; and the President of the Council, in giving their approval to the draft Instructions submitted to them in March last, thought it well to state that they had taken part in the enterprise with the view of securing that the Expedition should obtain as many and as valuable scientific results of all kinds as were possible, and that it was with the same view that they had used their best efforts to obtain the assistance of H.M. Government.

The Royal Geographical Society were unable to accept the Instructions, and proposed the appointment of a Committee of three members to be appointed by each Society, to re-consider the Instructions on the understanding that the decisions of this Committee would be accepted as final by the two Societies. The Committee accepted the suggestion, and the Committee, which was accordingly appointed, carefully considered the whole of the Instructions and introduced certain modifications, which, unfortunately, resulted in Prof. Gregory resigning the post of Director of the Civilian Scientific Staff. After careful consideration the President and Council resolved to invite the Royal Geographical Society to join with them in informing the Joint Committee that they approved of the appointment of Mr. George Murray, who had been acting as Deputy Director, to the following position. It was proposed that Mr. Murray should be the actual Director, but should not proceed with the ship farther than Melbourne, and would, meanwhile, in conjunction with the Commander, in accordance with the regulations, make such appointments in the Civilian Scientific Staff as might be necessary. It was also proposed that, on the return of the Expedition, Mr. Murray should, as Director, be the Editor of the scientific reports. The Royal Geographical Society adopted a resolution identical with that passed by the Royal Society Council with regard to the appointment of the Director; the Joint Committee also adopted the suggestions contained in the resolutions under reference, and Mr. Murray was accordingly appointed Director.

National Physical Laboratory.

During the past year progress has been made in the work of preparing Bushy House for the National Physical Laboratory.

rooms attached, has been built. A boiler-house and engine-room have also been erected, and a part of the machinery is already in position. The staff has been appointed, and some of its members are now actively engaged in fitting up the laboratory; the Director himself is in residence at Bushy. The alterations have been carried out under the direct supervision of Mr. Rivers of the Office of Works, and the Society is indebted to him for the care and skill displayed. It was found last May that the estimated expenditure, £14,000, would be exceeded by, at least, £3,000, and the Treasury undertook to ask Parliament for a further grant of this amount, thus raising the sum available for expenditure on new buildings and alterations to £17,000.

The Committee are again indebted to various donors for valuable gifts:—Messrs. Willans and Robinson have promised the apparatus necessary for the testing of steam indicators and pressure gauges; Sir W. G. Armstrong, Whitworth & Co., Messrs. Mather and Platt, and Messrs. Comptons, have made very substantial reductions in the cost of machinery and apparatus supplied by them; while Captain Creak and Major McMahon have each given some valuable books.

Disturbances of Magnetic Observatories.

The Committee appointed by the Board of Trade continued their investigations, and, as a result, it appeared clear that it was impossible to protect satisfactorily the Kew Observatory from disturbances due to electric traction. After protracted negotiations the London United Tramway Company indicated their readiness to bear some share of the cost of removing the Magnetic Observatory at Kew to some distant site. This offer was brought before the President and Council, and a Committee was appointed to deal with it. A statement as to the position was drawn up for the consideration of the Treasury, and a rough estimate of the expenditure involved was formulated.

Further negotiation took place, and in the end it was intimated to the Secretary to the Treasury that, provided arrangements were made for the removal of the magnetic instruments at Kew to a site free from magnetic disturbances, and for carrying on the work hitherto done at Kew on that new site with as little delay as possible, no further objection would be raised to permission being given to the London United Tramway Company to open their lines.

Accordingly arrangements were made by the Treasury for the payment by the Company of some portion of the expenditure involved, and the line was opened last Easter.

During the summer a Committee, appointed by the Executive Committee of the National Physical Laboratory, have been enquiring into the merits of various suggested sites.

Solar Eclipse.

The observations of the Eclipse of 1901, May 18, were, to a great extent, interfered with by unfavourable weather. Three observing parties were sent out, one by the Joint Permanent Eclipse Commission and two from the Royal Observatory by the Lords Commissioners of the Admiralty. The Admiralty, as on former occasions, have rendered most valuable assistance by detailing H.M. gunboat "Pigmy" to the service of the observers in Sumatra. One party of observers from the Observatory was conveyed with their apparatus from Padang, in Sumatra, to the small island of Auer Gadang, ten miles distant, and lived on the ship while the preparations for the eclipse were being made. Valuable assistance in the installation of instruments as well as in the observations on the day of the eclipse was rendered by the officers and crew. H.M. Secretary of State for Foreign Affairs also, at the request of the Council, provided important customs and landing facilities for the observers in Sumatra, and H.M. Secretary of State for the Colonies provided similar facilities in Mauritius.

Duplicate publication of Astronomical Papers.

A suggestion was received last year from the Royal Astronomical Society, that papers of astronomical interest read before the Society should be published in duplicate as appendices to the "Memoirs" and "Monthly Notices" of the Royal Astronomical Society. The Council referred the proposal to a Committee, and, upon their recommendation, and upon the assurance of the Royal Astronomical Society that care will be taken not to infringe the priority of the publications of the Royal Society, decided to transact at the request of the Royal Astronomical Society, an early publication of any such paper read before the Royal Society, and pass resolutions for publication, or ordered for printing during the recess, and to do so, and at the cost of, the Royal Astronomical Society, as many copies as may be required.

International Association of Academies.

The first General Meeting of the International Association of Academies was held at Paris from the 16th to the 20th of April, 1900, in the rooms of the Institute of France. It was attended by delegates from all of the delegates appointed by the Council of the Royal Society.

happened to be in Paris at the time. The Academies represented at the assembly were those of Amsterdam, Berlin, Brussels, Budapest, Christiania, Copenhagen, Göttingen, Leipzig, London (Royal Society), Munich, Paris (Inscriptions et Belles-lettres, Sciences, and Sciences Morales et Politiques), St. Petersburg, Rome, Stockholm and Vienna. On the part of the Royal Society two subjects were formally brought before the assembly, viz., the measurement of an arc of the meridian through Africa, and the International Catalogue of Scientific Literature. Certain regulations were framed and approved with regard to the financial arrangements of the Association. As the Royal Society has no section specially devoted to "Letters," its delegates only attended the meetings of the "Science" section of the general assembly, besides the general meetings where both sections were present. Provisional recommendations were adopted regarding the loan of books, manuscripts and instruments. The propositions made by the Royal Society with regard to the African arc of meridian were warmly approved by the Science section, and on its recommendation were unanimously supported by the general meeting, and it was agreed that the Association should transmit its resolution to the several Governments concerned. A scheme was formulated for the guidance of the several academies in respect of the choice of subjects that may be usefully studied and discussed by the International Association; likewise a plan for the efficient working of the special Committees entrusted with the consideration of questions to be brought before the Association. The next meeting of the Association was fixed to be held in London in 1904, the Royal Society becoming the "Acting Academy" on January 1st, 1902.

Malaria.

Reports from Dr. Daniels upon the distribution of *Anopheles* in East Africa, and from Drs. Christophers and Stephens upon malarial infection on the West Coast, have, since the last Report of the Council, been published in the form of Reports to the Malaria Committee. The two last-named observers are now carrying out researches in India, the scheme including the determination of the exact conditions by which malarial infection is brought about under a fresh set of conditions as in Indian cantonments, the conditions of infection in which relapses are possible, the exact influence of surrounding temperature on the development of the parasites in *Anopheles*, the possibility of infected *Anopheles* while hibernating carrying a parasite from season to season, and the nature of Black-water fever, including the historical investigation on the spot as to its

advent and spread in India. The Government of India has afforded every facility for carrying on the work, and results of practical importance are anticipated.

International Catalogue of Scientific Literature.

Considerable progress has been made with the arrangements for publishing an International Catalogue of Scientific Literature. Contracts with the printer and publisher, referred to in the Report, have been signed, and it is hoped that the work of publication will begin early in next year.

In October of this year the number of sets of the Catalogue subscribed for had risen to 336, being more than double the number officially subscribed for at the Conference of June, 1900, and in consequence of this increase the Royal Society will not be called upon to subscribe for the additional sets referred to in the Report. The Society, however, still remains responsible for 45 sets of the Catalogue, for which it has undertaken to collect subscriptions in the United Kingdom. Of these, no more than 10 have been promised up to the present time, and the Council trusts that the Fellows will take every opportunity of helping to secure further support for the Catalogue throughout the Kingdom. Subscriptions of Foreign Countries and the Colonies are at present: United States, 71 $\frac{3}{4}$ sets; Germany, 45; Great Britain, 45; France, 35; Italy, 27; Japan, 15; Canada, 8; Switzerland, 7; Sweden, 6; Holland, 6 $\frac{1}{4}$; Denmark, 6; India and Ceylon, 28; Mexico, 1; Norway, 5; Cape Colony, 5; Hungary, 4; Portugal, 1; Greece, 1; South Australia, 2; Western Australia, 1; Victoria, 1; Egypt, 1, one year; Nova Scotia, 1; New South Wales, 6; Royal Society, New South Wales, 1; Queensland, 2. Russia and Belgium have announced their intention to subscribe, but have not yet stated the amount of their subscriptions.

Regional Bureaus for collecting material have been established in 28 countries, and are now engaged in preparing Catalogue slips and transmitting them to the Central Bureau.

It is proposed to publish a complete list of the Journals indexed, and it is thought that such a list will be useful to others in addition to the subscribers to the Catalogue.

Meteorological Council.

A Committee was appointed last year to consider whether changes in the constitution and duties of the Meteorological Council were desirable. The Committee recommended certain modifications.

ingly drawn up and adopted at a General Meeting of the Association.

Five directors and five additional members of the Association were, in accordance with the provisions of these Articles, appointed by the Council this year.

Catalogue of Scientific Papers.

Progress continues to be made with the "Catalogue of Scientific Papers," and with the classified Index thereto.

The Council regrets that the work of the Supplementary Volume was not completed by the time mentioned in the last Report. In the course of the year, 42 sheets have been passed for printing, bringing the Catalogue down to the letter T. It is estimated that the remainder of the slips will, when set up, amount to 12 more sheets.

The work of preparing the slips for the Subject-Index up to the end of the Supplementary Volume (Vol. XII.), and of roughly classifying them, is proceeding, and should be completed immediately after the publication of that volume. The whole material thus accumulated will amount, roughly speaking, to 360,000 slips. Of these about 90,000 have been examined and revised by the Editor. By the end of the year the whole of the Meteorological and Astronomical papers in the volumes of the Catalogue already published will have been revised by him. The titles of many of the papers published in Astronomical Journals, especially the "Astr. Nachrichten," are given in an imperfect manner in the earlier volumes of the Catalogue. It has been found necessary to revise the defective titles in order that these papers, most of them from important observatories, should be adequately referred to in the Subject-Index.

Considerable progress has lately been made with the Mathematical slips, and it is hoped that the whole will be finished by about the end of March.

Upon the recommendation of the Catalogue of Scientific Papers Committee the Council has undertaken the preparation of an Author's Index and of a Subject Index thereto, relating to the scientific literature of the years 1834 to 1900. It is roughly estimated that the cost of preparing the Catalogue, which will occupy four volumes of about 1,100 pages each, will be between £4,000 and £5,000, and that the preparation and printing of the volumes will occupy not more than five years.

At the invitation of the Council, Prof. McLeod, F.R.S., has undertaken the duties of Director of the Catalogue.

Gunning Fund.

The triennial allocation of the interest accruing from this Fund, which, on the last occasion was allotted to the Kew Observatory for the purpose of comparisons of the mercury, platinum, and gas thermometer scales over a wide range of temperature, has this year, on the joint recommendation of three Sectional Committees, been made over to Dr. W. H. R. Rivers' proposed Expedition to Southern India in 1902, for the purpose of making experimental psychological observations, and studying the social organisation, of the Todas and other Hill tribes.

Joule Studentship.

The biennial election to the Joule Studentship was this year made under the terms of the Trust, placed by the Council in the hands of the Königl. Akademie der Wissenschaften of Berlin. The Academy nominated Dr. U. Behn for the Studentship, to be aided in aiding him in a research for the establishment of a direct connection between the measurements of ice calorimetry and water calorimetry.

Mackinnon Studentship.

The first award of this Studentship, the foundation of which has been referred to in previous Reports, has, on the recommendation of a Committee appointed to consider the claims of candidates, been made to Mr. J. J. R. Macleod, to aid him in researches in pathological chemistry. The Council has, on the recommendation of the Committee, added a clause to the regulations limiting the award of the Studentship to British subjects.

Publications.

During the past year 23 papers have been published in the Mathematical and Physical section, and 7 in the Biological section of the "Philosophical Transactions." The two sections together contain, in all, 1,345 pages of letterpress and 74 plates. This year the numbers of the "Proceedings" have been issued, containing 100 pages and 6 plates.

In all, 116 papers were received between the close of the Session in June, 1900, and the corresponding date in 1901. Of these 100 were submitted for publication in the "Philosophical Transactions" and 65 for the "Proceedings"; and 44 and 57 have been ordered for publication in the "Transactions" and "Proceedings" respectively.

to the 474 which the Society already received regularly by exchange or purchase. Besides these, 86 books have been added to the Library by presentation or purchase. Among the additions may be specially mentioned :—"Illustrations of the Botany of Capt. Cook's Voyage in the *Endeavour*," Pt. 2; Brioschi, "Opere Matematiche," T. 1; Dr. John Hopkinson's "Original Papers," with a Memoir; Huxley's "Scientific Memoirs," Vol. 3; Huxley's "Life and Letters"; Nansen's N. Polar Expedition, "Scientific Results," Vol. 2; "Rapports au Congrès International de Physique, Paris, 1900"; "Annals of the Astrophysical Observatory of the Smithsonian Institution," Vol. 1.

Government Grant.

Under the regulations for the administration of the Government Grant, the Council has, upon the recommendation of the Government Grant Committee, made grants amounting to £3,062, including £333 6s. 8d., the second instalment of the promised grant of £1,000 to the Joint Antarctic Committee. A sum of £500 has, in accordance with the regulations, been placed at the disposal of the Council of the Royal Society to meet any pressing demands upon the fund which may be made before the next Annual Meeting of the Government Grant Committee. The sum of £295 5s. 10d. was carried to the Reserve Fund Account.

Challenger Committee.

In the course of the year the Challenger Committee have made several recommendations to H.M. Treasury for the presentation of volumes of the "Challenger" Reports to various institutions. These recommendations have in every instance been acted upon by the Treasury.

Publication Grant.

Out of the Grant of £1,000 annually placed in the Society's hands by His Majesty's Government "to assist not merely their own publications, but also the adequate publication of scientific matter through other channels and in other ways," the sum of £471 13s. 4d. has been voted out of the Grant for this year to societies and agencies other than the Royal Society. Of the total sum of £6,000 received by the Society in respect of this Grant since its initiation, the sum of £2,467 11s. 8d. has been so applied.

General Business.

At the celebration, in Berlin, of the eightieth birthday of Rudolf Virchow, the Society was represented by Lord Lister, who on behalf of the Council, presented a congratulatory Address.

The Society was also represented at the Ninth Jubilee Celebrations of the University of Glasgow, and an Address was presented to the delegates.

Secretaries' Tenure of Office.

At its Meeting on October 31st, the Council received a memorial "praying the President and Council to take into immediate consideration the advisability of limiting the tenure of office of future Treasurer or Secretary," and also a memorial expressing decided convictions of the memorialists that the change advocated by the preceding memorial would not be in the interests of the Society.

At the Meeting of the Council on November 7th, these memorials were taken into consideration. It was proposed as a resolution "That, in the opinion of this Council, it is desirable that the Secretaries should not be so re-elected as to hold office for a period exceeding ten consecutive years, this resolution not to apply to the present holders of office," and, after considerable discussion and consideration of various amendments, the resolution was carried.

Junior Secretary.

The appointment of Professor Rücker to the important post of Principal of the London University has necessitated his relinquishing all other duties, and among them that of Secretary to the Society.

The Council desire to express their high appreciation of the valuable services which Prof. Rücker has rendered to the Society during his term of office, and their sense of the great loss to the Society which his resignation entails. They wish him all success in his new labours.

After full consideration the Council, with full confidence and approval of the Society, submit the name of the distinguished mathematician and physicist, Dr. Joseph Larmor, for election to the office.

1. *Reference to the Committee.*

Your Committee have held several Meetings for the discussion of the subject referred to them by the Council in the following Minute, viz. :—

“That Lord Dillon’s letter and Prof. H. Sidgwick’s plan (appended) be referred to a Committee, composed of the President and other Officers, Prof. H. E. Armstrong, Rt. Hon. J. Bryce, Sir J. Evans, Prof. A. R. Forsyth, Prof. E. R. Lankester, Sir N. Lockyer, Sir W. Roberts-Austen, Prof. A. Schuster and Prof. E. B. Tylor, with instructions to make such inquiries, and for that purpose to confer with such persons as they may think desirable, with the view of laying before the Council a report on the suggestions made in the plan, stating the various reasons which may be urged for and against them.

Under the powers given to them by the terms of reference, your Committee have placed themselves in communication, through Prof. Sidgwick, Prof. Jebb, and Lord Acton, with a number of representatives of those branches of learning referred to in Prof. Sidgwick’s suggestions, with a view to ascertaining the method of organization which would be most likely to enlist the support of the recognised leaders of thought in those subjects. On May 29, an interview took place, a short account of which will be found on a subsequent page.

The Committee have not considered it necessary for the present purpose to consult the Councils of the various learned Societies who are, or might be, interested in the discussion, nor have they deemed it desirable to review the opinion expressed in the latter part of the last sentence in Lord Dillon’s letter.

2. *Origin of the question referred to the Committee.*

The attention of the Committee was called to the following facts, which they understand to have originated the inquiry referred to them :—

The Royal Society has taken an active part in the foundation of an International Association of the principal Scientific and Literary

Academies of the world, which will probably hold its first meeting in Paris in the autumn of 1900.

A scheme for the organisation of the Association was drawn at a meeting of the representatives of the chief European American academies, held at Wiesbaden in October, 1899. The scheme, which has been approved by the Council of the Royal Society, provides for the division of the Association into two sections—"Scientific" and "Literary" respectively. The word "Literary" is used only as a short term to indicate the sciences of Language, History, Philosophy, Antiquities, and other subjects the study of which is based on scientific principles, but which are generally included under the term "Science." It is not intended to include Literature as such, and therefore it will be better to use the term "Philosophico-Historical," in accordance with frequent usage on the continent of Europe.

The two sections are for most purposes independent of each other.

The Royal Society will be connected with the scientific section, but no existing Institution is competent to represent the United Kingdom in the Philosophico-Historical section.

The representatives of the Royal Society were therefore unofficially requested to take such steps as might be possible to fill this gap.

3. Possible organization of Philosophico-Historical research.

It is clear from the above facts that the matter cannot be put aside beyond the scope of the Royal Society. The adequate representation of this country in both sections of an Association of Academies, the foundation of which the Society has played a leading part, cannot be a matter of indifference to the Society itself.

It was understood by the representatives of the Royal Society at Wiesbaden, as the result of informal conversations: (1) That the Institution would be regarded as an Academy, for the purposes of the Association, which did not embrace a considerable range of subjects, *i.e.*, no special Societies would be admitted; (2) that members must be chosen for merit; and (3) that, as far as possible, there should be only one Institution in each country representing each of the two sections of the Association.

It is important, however, to remember that the problem to be solved is pressing and practical, and that, if England is to be immediately represented on this second section of the International Association, no scheme will be adequate which does not provide for some considerable and immediate change, either in the action of the Society or in the organisation of those branches of learning which are connected with the Philosophico-Historical section.

into those of no relation with the workers in each of the sciences. Societies have been founded for the promotion of some of them, but these Societies are not linked together by the membership of their leading members in one body of recognised authority and influence, such as the Royal Society provides for the investigators of various branches of Mathematical, Observational, and Experimental Science.

The advantages which the gathering into one body of the men most eminent in the subjects above specified have secured in Germany, France, Italy, and Belgium do not exist here, and the absence of any effort to secure them has often excited the surprise of learned men in those countries. Neither is there in England any series of Transactions similar to those of the leading Academies of Continental Europe, in which records of the most fruitful inquiries in those subjects, or even systematized references to such inquiries, may be found.

4. Relation of Royal Society to such organization. Arguments in favour of action by the Society.

If these considerations are well founded—and upon this point great weight seems to be due to the opinions of the eminent men who have addressed your Committee—the following reasons, among others, have been suggested as making it desirable that the Royal Society should take action in the matter, viz. :—

Assuming the organization of the above subjects to be called for in the general interest of the intellectual progress of the country, the Royal Society can promote their organization more effectively than could be done by the persons who are occupied in the study of them, because these persons have no sort of combined corporate existence, and no voluntary group of them would appear to have a proper *locus standi* for appealing to the public or approaching the Government in order to attain the object sought.

It has been urged on general grounds, that the inclusion by the Royal Society of a section corresponding to the Philosophico-Historical and Philological divisions of the German Academies would strengthen the Society by broadening the range of its scientific activity and increasing its influence; and would be to its advantage inasmuch as such a course would anticipate and thereby make needless the formation of an association which, by gathering the subjects within its scope, might to that extent be in rivalry with the Royal Society, and tend to narrow the legitimate range of its activity.

The Society exists for the promotion of Natural Knowledge. interpretation of the term "Natural Knowledge," according to present practice of the Royal Society, assigns to it a range : Mathematics to the various Biological sciences, and this secures inclusion of the scientific study of man in his biological relations has been argued that this range might be properly increased by inclusion of the scientific study of man in his reasoning, social, historical relations. It may, indeed, be further contended that Society should include in its scope all branches of Natural Knowledge which are capable of consecutive and ordered development. Such a test would permit the inclusion of subjects such as Psychology, Economics, Historical Science, and Philology in the widest sense of the term, which, under the present practice of the Society, may be deemed excluded, but which, when pursued as they now are by the most capable students, in a scientific spirit and by scientific methods, do fall within the domain of Natural Knowledge. The investigation, for instance, of the phenomena of the origin and variation of human speech, of the beliefs and customs of primitive man, of the production and distribution of wealth, of the laws which govern the development of political societies, is an investigation into natural phenomena in a sense which the progress made in our conception of nature during the last two centuries seems to justify.

The supporters of this view hold further that this extension of the Society's range would tend to increase the influence of the Society not only in the general world of learning, but also in its relations with the Government, to which it already practically occupies the position of official adviser upon projects of a scientific character.

5. Constitutional Powers of the Society, and its practice.

Among the aspects of the question referred to them, your Committee have given considerable attention to a discussion of the powers of the Society, under its Charters, to make any such change might be involved in enlarging its scope in accordance with Prof. Sidgwick's suggestion marked 2 (a).

In considering the meaning to be put upon the language of the Charters it is, of course, important to have regard to the interpretation of them which has hitherto been accepted.

From a note presented to the Committee on the character of the papers read before the Society in the earlier years of its history it appears that of the 4,166 papers which appeared in the "Transactions" during the period from the foundation of the Society to the end of 1800, the number which deal with subjects not included under the terms "science" or "natural philosophy" is scarcely sufficient to be regarded as establishing a usage of

It is evident that the Charters have never been interpreted as confining the "studies" of the Society to "further promoting by "the authority of experiments the science of natural things and "of useful arts" in the strict modern meaning of those words. Indeed, the Second Charter in terms empowers the Society to hold meetings "for the examination and investigation of experiments *and of natural things*," and both Charters authorise it to "enjoy mutual intelligence and affairs with all and all manner of "foreigners" . . . "in matters or things philosophical, mathematical, or mechanical." The provisions of the first Statutes that the business of the Society at its meetings shall be "to order, take "account, consider, and discourse of philosophical experiments and "*observations*; to read, hear, and discourse upon letters, reports, and "other papers containing philosophical matters; *and also to view and "discourse upon rareties of nature and art*," and the long and uninterrupted usage to receive papers on observational sciences, such as geology, or on pure mathematics, certainly do establish a *contemporanea expositio* which must be taken into account as *optimus interpres* and *fortissima in lege*.

Even had papers upon philological, psychological or other subjects been entirely absent, no stress could be laid upon that fact, if in the opinion of the Society those subjects have, under modern methods of treatment, become observational sciences, and as fully parts of "Natural Knowledge" as those subjects which were recognized as such at the epoch of the foundation of the Society.

It would clearly be *ultra vires* for the Society to resolve to receive a new class of papers, incapable of being regarded either in subject matter or in scientific treatment as in the same category as those which have hitherto been received. But it would not be unlawful for the Society to determine to receive papers on subjects not hitherto regarded as properly within its scope if it came deliberately to the conclusion, that, in view of the scientific method in which they were now being treated, those subjects ought not to be excluded from its study.

The Committee has had the opportunity of privately consulting two high legal authorities, whose opinions lead the Committee to believe, in confirmation of the views above stated, that the inclusion within the scope of the Society of such subjects as have been referred to, if treated by scientific methods, is within the powers of the Society.

6. Four Solutions considered by the Committee.

There have been submitted to the Committee four possible ways of

dealing with the demand for the representation of Philosophical and Historical studies in an "Academy":—

- (i.) The creation of an organization independent of the Royal Society, though possibly in some way connected with it, in which case they might both form parts of some larger organization, as, for instance, the French Academies form parts of the Institut de France.
- (ii.) The creation of two "Academies" within the Royal Society, one of Mathematics and Natural Sciences, the other of Philosophy, History, each Academy having its own Council, Secretary, and President, and the President of each being in addition President of the whole Society.
- (iii.) The creation of two or of three "Sections" of the Royal Society, either A and B, corresponding to the Academies just named; or A, Mathematical and Physical Sciences; B, Biological Sciences; C, Philosophico-Historical Sciences.
- (iv.) The election of some 25 to 50 Fellows representing Philosophico-Historical subjects, to serve as a nucleus, and the creation of three or four committees, similar to those already existing, viz., one for Ethnography and Archæology, one for Philology, one for Statistics and Political Economy, and one for Psychology the Officers and Council remaining, so far as statute and enactment are concerned, precisely as they are at present.

(i.) *A new organization independent of the Royal Society.*

To consider first the case of (i.) a new organization independent of the Royal Society.

In order to provide for the adequate maintenance of the status of such an Academy should hold, it would probably require a Charter from the Crown, and a public endowment.

An Academy so established would undoubtedly enable the various branches of learning, the public neglect of which, in this country, compared with foreign countries, has, we are told, operated to their detriment, to take a position of greater importance and interest in the eyes of the country than if they were to be confined to being admitted for occasional discussion among many other subjects in the Royal Society.

The foundation of a representative body on a less ambitious footing, e.g., on the basis of some of the existing special Societies, while it might meet the requirements of the International Association, would command less of the advantages above stated; but it would, on the other hand, disarm some of the principal objections

One of these objections is that such a body might enter into serious competition with, and reduce the prestige of, the Royal Society in its relations with the Government; and even that there might be conflict between the two bodies over the discussion and representation of subjects in respect of which they might overlap.

The initial difficulty in recommending the establishment of an independent body is the fact, evidenced by the letter which forms part of the reference to this Committee, that leading representatives of the branches of learning now under discussion do not apparently see their way to suggesting any practical steps towards the establishment of an independent Academy.

The other three plans contemplate action within the Society.

The remaining three courses all contemplate action within the Society itself, and may be considered together in this general aspect before being discussed severally.

The argument of the possible rivalry of an independent body has been already mentioned, and no doubt deserves serious consideration. The effect of adding to the importance of the Royal Society by extending the range of its influence in the field of learning, strengthens the arguments in favour of action within the Society. It has also been urged upon the Committee with some force that the Society, having regard to its chartered functions and the responsibilities of the position which it now holds, has no right to ignore, as unscientific, branches of learning the pursuit of which by scientific methods should be encouraged in the interests of the advancement of Natural Knowledge.

On the other hand, when an attempt is made to formulate any scheme for giving practical effect to the extension of the Society's functions, serious difficulties present themselves.

(ii.) Creation of two Academies within the Society.

The suggestion involving the largest constitutional change is the first of the three now under consideration, viz., the creation of two Academies within the Royal Society, each having its own Council and Officers, and furnishing in turn the President of the whole Society. Such a system would have the advantage of giving to the representatives of the Philosophico-Historical branches more scope and independence of action than they would obtain under the more restricted arrangements contemplated by plans (iii.) and (iv.), and would at the same time relieve the Royal Society's general Council of a proportionate amount of responsibility. It offers a mode of

escaping the complications of a duplicate co-equal Presidency of Society, and would seem to provide the means of double representation on the International Association in an unexceptionable form.

On the other hand, the question of the Presidency, as well as of the possible conflict of authority of the two governing bodies, the difficulty of avoiding such conflicts by the establishment of a joint governing body for the whole Society, present grave objections to this proposal.

Under such a scheme the one name of the Royal Society would cover two Associations with, possibly, divergent interests and different methods of procedure. If the two Academies' Councils were subject to the control of a central Council, it is probable that the composite constitution of that body would impair the authority of its decisions.

The question of the alternating Presidents again presents serious difficulties. It is very doubtful if the Fellows of the Society, as constituted, would be willing that the official head of British science should sometimes be a historian or a philologist, while, on the other hand, the historians and philosophers might be expected not to be content with the official leadership of a distinguished mathematician or chemist.

A further objection to this proposal is that it would involve a fundamental change in the constitution of the Society, which could only be effected under a new Charter, to be obtained from the Crown. This would be a wide departure from the historical and traditional associations of more than 200 years.

(iii.) *Creation of sections within the Society.*

Under the plan (iii.) for the creation of two or three sections of the Royal Society, various arrangements are possible in relation to the existence of one supreme Council, and the delegation of powers to the sub-Councils of each Section. But one President and one ultimate Council for dealing with questions affecting the whole Society must be considered as an essential feature of the scheme. It would be possible to allow the Councils of Sections to receive Fellows for election, to award medals, and to elect their own members—with or without ratification by the Council of the whole Society. It would be possible to reserve for the supreme Council of the Society certain limited functions, such as the appointment of members of the Councils of Sections; or, on the other hand, to leave to the latter only the authority to accept papers for reading and publication, and to reserve all other matters for the supreme Council of the Society.

this alternative in the group of Philosophico-Historical Sciences (taken in the sense already explained), the sectional method of carrying out an enlarged scheme of work offers some practical working facilities, and seems to afford a means of extending the range of the Society by measures of domestic organisation without such large constitutional changes as would be involved by the creation of two Academies. At the same time it is doubtful whether these sections could be established on a footing of so much independence as they would probably require to make them effective in the representation of their branches of knowledge, without changes in the present organisation of the Society, which would require careful consideration.

Moreover, the Committee are not in a position to state whether such a representation of the Historical Sciences within the Society would meet the requirements of the International Association for the representation of Great Britain in the Philosophico-Historical Section.*

Either of the second or third alternatives under consideration would involve the addition to the Society of a considerable number of new Fellows representing the new subjects, and some proportional representation on the supreme Council. Considerable difficulties present themselves when the practical organisation for carrying out such a scheme is considered.

Thus it is important to consider whether the immediate election of (say) fifty distinguished representatives of Philosophico-Historical studies, and the annual election of three representatives of these subjects in addition to the fifteen at present elected, would be adequate. If the numbers were as small as this, how many additional Members would have to be added to the existing Council? If three, there would only be one representative of such subjects as Philosophy, History, and Language, and these would have to alternate with representatives of Economics, Antiquities, and Psychology. It is for those expert in these subjects to say whether such representation would be sufficient, and whether a Council of which only three or four such persons were members, and on which they were outnumbered in the proportion of five or six to one by representatives of Mathematical and Physical Science, would command the confidence

* The only definition in the Statutes of the Association of the fitness of an Academy to be represented in both sections of the Association of Academies is as follows :—"2. A General Assembly shall consist of two sections, viz., a section of Natural Science and a Literary and Philosophical section. 3. An Academy may send delegates to one or to both sections, according to the nature of its sphere of action."

of the Philosophico-Historical Fellows. Whatever the answer to this question may be, it is evident that an approximation to one of these courses would have to be adopted :—

- (a.) There must either be practically co-equal Councils or Committees dealing with the affairs of the several Sections respectively, or—
- (b.) If there is one Council which professes to control all the Sections, it may delegate more of its work than is at present done, using the Sectional Committees for this purpose, and appointing additional Committees to represent the more numerous included subjects.

(iv.) *Gradual Enlargement of scope of Society.*

The fourth plan is directed to effecting an enlargement of the scope of the Society's work by a more gradual process of introduction of new elements, and their development under the existing organisation of the Society. Such a scheme might be expected to attain the object, advocated in an earlier part of this report, of extending the range of the Society in the general interests of learning. In respect of its effecting an adequate representation of the United Kingdom in the new subjects to the satisfaction of the workers in those subjects, it presents the same practical difficulties as have been pointed out in respect of alternative (iii.), and it probably would prolong the period which must elapse before the Royal Society could be held to include Philosophico-Historical subjects in its sphere of action.

Nevertheless, apart from the question of whether immediate representation on the International Association can be claimed, this scheme affords a possible means for the future establishment of an independent Academy of Letters without detriment to the Royal Society, without the fact detaching from it and organizing a new body of scientific workers, since the scientific workers who might possibly be drawn to such an Academy would be already enrolled in the Fellowship of the Royal Society.

It has, moreover, been urged that many of the difficulties involved in the adoption of either of the last two plans could be overcome, and that all that is necessary could be attained without increasing the Council or adding to the number of Fellows elected. If the members of Council were chosen from among representatives of the Philosophico-Historical sciences, they would have as good representation numerically as some branches of science possess at present. Even if money difficulties arose, it might be better to face the

nucleus mentioned on p. 4, will depend upon whether a diminution in the number representing Natural Science would satisfy the requirements of that branch as distinguished from the new subjects. It is also argued that, as physicists support a President who is a biologist and *vice versa*, both groups would approve the selection of a distinguished representative of the new subjects as head of the enlarged Society.

7. *Views of Representatives of Philosophico-Historical Sciences.*

These several schemes were discussed at an interview (mentioned on p. 2) with a number of representatives of the Philosophico-Historical Sciences. These gentlemen all concurred in disapproving of any attempt to establish an independent body to represent the sciences in question by means of the federation of any existing societies, and appeared so impressed with the difficulties of founding an independent body *de novo* that they shrank from attempting it. They therefore all expressed themselves in favour of any effort for the corporate representation of those sciences being associated in some way or other with the Royal Society. They seemed unanimous in feeling the great desirability of the organization and official representation of the Philosophico-Historical subjects, both on the ground of the general encouragement of their pursuit, and also, and more especially, as a means of developing the more scientific methods of treating those subjects.

The general opinion of these gentlemen upon the practical courses discussed in the Report seemed to be in favour of the plan numbered (iii.) in the Report, but, recognising the practical difficulties in the way of carrying out any such scheme immediately, they were generally in favour of an effort being made on the lines laid down in plan numbered (iv.) as a beginning, in the belief that should its adoption lead, as they believe it would, to greater activity in this country in the studies in question, there might ultimately develop out of it some more formal organization, such as is contemplated in the other plans submitted.

Your Committee were much impressed by the concurrence of opinion among these gentlemen, and by the high value they set on the inclusion within the scope of the Royal Society's action of the subjects they represented.

8. *Fundamental issue.*

Apart, however, from all such questions, the fundamental issue is whether the Royal Society will be more useful if the area of its

interests is enlarged. If the principle of such enlargement be agreed to, it would be possible to begin tentatively, and to allow the future organization of the Society to be decided by future experience.

The first question to decide, therefore, is not whether the changes involved will be great or small, or whether this or that method of meeting new conditions is the best, but whether the group which might result if the Royal Society represented History, Economics and Philosophy, as it now represents Physics and Biology, would compensate the disadvantages which might arise from the loss of singleness and concentration of aim, and the ultimate complication of organization.

9. The division of the sciences.

In this connection it is desirable to enquire whether there is any real difference of object or method in Natural Science and in the Philosophico-Historical group which justifies the separation at present existing between them. The arguments on one side of the question have already been given on page 3 (Section 5). On the other hand, it is contended that although the various branches of knowledge are so interwoven that it is difficult to trace accurately the lines of division between them, yet the group of sciences which the Royal Society is at present concerned, and those which it is proposed to introduce, are in broad outline distinct.

As has been stated, the Royal Society at present deals chiefly with Mathematics, with the science of non-living matter, and with the development, structure and forms of living matter. The Philosophico-Historical group of sciences is chiefly occupied with the mind, the constitution, the history, and the works of man.

It is true that the two groups overlap, but the closeness of the relations between them depends on the relative size of this corner of the region to the much larger area in which their methods are distinct.

The group of Natural Sciences are largely cultivated by means of experiment and the use of apparatus; while the Philosophico-Historical group rely comparatively little on these means of investigation.

Again, the included sciences are practically applied in industry, commerce, and medicine, in a manner the utility of which is less disputed than is that of applications of the doctrines of Political Economy, or of inferences from History.

In France, as in England, there is an Institution (the Académie des Sciences) which includes within its scope only Mathematics, the Physical and Biological Sciences; the Philosophico-Historical sciences are provided for in other Academies.

In Germany and elsewhere the distinction is less insisted on, but an argument in favour of adhering to our present system may be found in the fact that most foreign Academies are relatively small bodies, and do not include, as the Royal Society does, the younger workers. The Academy of Berlin is almost exclusively composed of men who are otherwise in close relationship as professors of the same University, and a similar statement is true of many other Academies. The probability of harmonious co-operation between the representatives of very diverse subjects is thus increased, and the working of an institution consisting of a relatively small number of men who are otherwise colleagues affords no indication of the probable results of extending too widely the sphere of action of a Society which numbers more than 400 Fellows who are scattered all over the United Kingdom and the Colonies.

A number of other points would also require careful consideration. If the new subjects were to benefit by the Government Grants for research and publication, the sums now at our disposal would be still more inadequate than they are at present. If they were not to share in these Grants, nor in the proceeds of any past endowments, such regulations might tend to divide the Society into sections with comparatively weak common interests.

As the Government organ for science, the Royal Society has relations with the great special Societies (Chemical, Geological, &c.), and also with the Institutes which represent various branches of technology. The foundation of the National Physical Laboratory has recently drawn those relations closer.

It has been questioned whether the confidence reposed by these Societies and Institutes in the administration of the Government Grant, &c., would be as great as it is now if the Council of the Society were to include a number of members representing subjects which had little or nothing in common with their own. It would be a very serious matter if, in attempting to add to its work, the Society were to become, in the opinion of the scientific and technical world, less efficient in what it has already undertaken.

Additions to the number of the Secretaries, the question of holding common or separate meetings, the probable increase in the number of Committees meeting in the apartments of the Society, the need for an increase and a revised organization of the Staff, all these points—some of which involve additional expenditure—would have to be carefully considered before the Society undertook a new departure, and, though matters of detail, they are not unimportant.

But we need hardly add that, although we have felt it our duty to state with some minuteness such difficulties as may be thought to

stand in the way of any of the foregoing plans, we are far from intending to express an opinion that any difficulties of detail ought to prevent the important issues involved from being fully considered on their largest bearings, having regard to the great benefits which might be expected to result to the progress of the Philosophical and Historical Studies, and possibly to the Royal Society itself, from the inclusion of those studies within the scope of the Society's action.

THE PRESIDENT'S ADDRESS.

Since the last Anniversary the Society has shared with the Empire in the supreme loss of their beloved Sovereign of blessed memory Queen Victoria, who during the sixty-three years of her reign was Patron of the Society.

The Society has lost by death Her Sacred Majesty Queen Victoria, Patron, nine Fellows, and four Foreign Members.

The deceased Fellows are :—

Sir John Conroy, Bart., died December 15, 1900, aged 55.

Lord Armstrong, died December 27, 1900, aged 91.

Dr. William Pole, died December 30, 1900, aged 86.

Professor George Francis FitzGerald, died February 22, 1901, aged 50.

Dr. George Mercer Dawson, died March 2, aged 52.

John Christian Malet, died April 9, aged 53.

Professor Henry G. Hennessy, died March 8, aged 76.

Professor John Viriamu Jones, died June 2, aged 45.

Dr. Charles Meldrum, died August 28, aged 80.

The Foreign Members are :—

Charles Hermite, died January 14, 1901, aged 78.

Henry A. Rowland, died April 16, aged 53.

Henri de Lacaze-Duthiers, died July 21, aged 81.

Professor Aleksandr Kowalewski, died November 22, aged 61.

Biographical records of these Fellows and Foreign Members will appear in due course, in the Year-book and the Obituary Notices, but for some of them, it seems to me, a brief notice is called for at this meeting.

We mourn, with special sorrow, two active workers in science whose thread of life has been cut by the Fates prematurely. One who having barely attained the meridian of life, by their distinguished and distinguished services for science, justified us in naturally looking to them as fruitful authors of scientific progress during the immediate future. I need not say that I am speaking of our late Fellow Professor FitzGerald, and of our late Foreign Member, Professor

man universal in his interests and in his powers. It was only a few years ago that he showed that he still retained his athletic skill, in the carrying out his experiments on the mechanics of flight. In the words of his colleague Professor Mahaffy, "He knew everything in Nature from the hyssop on the wall, to the cedar of Lebanon. He studied every construction, from the knitting of a stocking to the cooling of a planet;" while on the moral side, he was pre-eminently the "parfit gentil knight," always ready to turn aside from his own great adventures, to give a helping hand to anyone, however humble, who asked his aid.

Under the influence of the arduous training of the Dublin Fellowship examination in pure mathematics and in metaphysics, and possessing a brilliant imagination, it is not surprising that the distinctive principle of his scientific work was, perhaps, its tentative and pioneering character, ever seeking to advance through particulars to general views. His intellectual activity, enriched by a luxuriant imagination, extends over a very wide field of unexplored territory, lighting up dark places, and bringing the unknown within the acknowledged domain of science. His intellectual individuality showed itself strongly in his way of working. Larmor says:—"Although an accomplished mathematician, he preferred to reason in terms of direct images of the phenomena, and to reserve algebraic representations for purposes of calculation; he had early acquired the use of the quaternion analysis, and handled it with facility, and it was interesting to watch him getting to the bottom of a tangled scheme of physical relations by jotting down a few brief vector equations."

We have but one defect to record: he allowed his zeal to devour him. Under stress of most varied work he aged prematurely, and though his energy never flagged, his strength failed him, and he died at the early age of 50.

FitzGerald was fortunate in his birth. The influences of heredity, and of his early training and associations, were in his favour. He was born in 1851, second son of William FitzGerald, Bishop of Cork, and afterwards of Killaloe, a distinguished theologian and metaphysician; his uncles on both sides being famous for learning and for scientific work. After an early education at home by a sister of the great mathematician and logician, George Boole, he entered Trinity College, Dublin, at 16 years of age. He took his degree in 1871 at the head of the lists, both in mathematical and physical science. From that year to 1877, in which he obtained his fellowship, he devoted his studies to portions of the classical writings of Lagrange and Laplace, Hamilton and MacCullagh, and to a formal study of metaphysics. For four years he served with great success as a college

tutor, being elected in 1881 to the Chair of Natural and Experimental Philosophy.

Notwithstanding his heavy duties in the care of the laboratory, a large amount of elementary teaching work, as an Examiner in Physics in other Universities, as Referee for learned Societies, a large correspondence with scientific friends asking for his assistance, always freely given on knotty points of all kinds, and the discharge of his public duties, which in later years he allowed, perhaps not too wisely, to increase in extent and importance, he still found time to become one of the most learned men of his time in all branches of physical science, both theoretical and applied, and to leave his mark on the scientific progress of his age.

This is not the place for any attempt at a detailed account of his contributions to scientific progress. A statement of his work will appear in due course in the Obituary Notices.

The physical problem attacked in his first published paper in 1876, was the then recently announced Kerr Effect, the Displacement of the Plane of Polarisation of Light on Reflection from a Magnet. This was followed, two years later, by a memoir, printed in our 'Transactions,' "On the Electro-magnetic Theory of the Reflection and Refraction of Light." The main interest of this memoir consists, perhaps, in the dynamical formulation of the electric theory of light on the basis of the Principle of Least Action, and in the comparison of that theory with the optical work of MacCullagh.

In recent years he took a leading part in the critical discussions regarding the laws of osmotic phenomena and electrolysis, and the ionisation of solutions. One of his latest papers was on the Zeeman effect produced by a magnetic field. He was the first to develop in a definite quantitative manner its relation to the Faraday magneto-optic effect.

In 1899, one of the Royal Medals was awarded to FitzGerald for "his brilliant contributions to Physics." In FitzGerald, Trinity College has lost one of the most brilliant of her sons; the Royal Society one of the most distinguished and most genial of its Fellows; Science one of the most seer-like of her disciples.

It is equally true of FitzGerald, what his American biographer says of Professor Rowland, to whom we must now turn, "There is no one to take his place."

Professor Rowland, like FitzGerald, was cut down in the midst of his days—in his 53rd year. What his biographer goes on to say of his immense personal influence upon his generation, brings back to us too the resistless charm of FitzGerald's personality, to whom the words as truly apply: "His inventions, discoveries, and scientific researches are not his greatest gift to the world. More important even than these was his influence on his generation by his spirit, his

aims, and through the many students and associates who came to know and appreciate him. He was continually inspiring his students to aim at the highest ideals. The great simplicity and truthfulness of his character made him beloved by everyone who came near him."

To him, indeed, science was another word for truth. Rowland's own words are worthy of record here: "But for myself," he says, "I value in a scientific mind most of all that love of truth, that care in its pursuit, and that humility of mind which makes the possibility of error always more present than any other quality. This is the mind which has built up modern science to its present perfection, which has laid one stone upon the other with such care that science offers to the world to-day the most complete monument to human reason. This, too, is the mind which is destined to govern the world in the future, and to solve problems pertaining to politics and humanity as well as to inanimate nature.

"It is the only mind which appreciates the imperfections of the human reason, and is thus careful to guard against them. It is the only mind that values the truth as it should be valued, and ignores all personal feeling in its pursuit. And this is the mind which the physical laboratory is built to cultivate."

Surely it is this pure quest of truth for truth's sake which is our most sacred trust and inheritance as Fellows of this Society.

Rowland's acute and active mind never rested in details, but was always going through and beyond his immediate laboratory results to some wider questions which he believed to lie beyond them. For example, even his classical spectrum observations, which extended over many years, would have had but little interest for him, but for his strong belief that by means of the conclusions at which he expected to arrive, he would be able to deduce some definite ideas as to the true nature of the molecules of matter. This was the goal he kept before him in all his work. He would often say: Where is the Kepler for molecules?

Rowland was born at Honesdale, Pennsylvania, in 1848; he was the son of a Presbyterian minister. As a boy, all his inclinations were towards scientific work and experiments. After a short experience as a railway engineer, and then as a teacher of general science, he became assistant professor in Troy. It was here that he performed his classical experiments on the magnetisation of iron. The paper was refused by an American journal as unsuitable for publication, and a rather presumptuous one for an unknown man. Rowland thereupon sent the manuscript to Professor Clerk Maxwell, who at once printed it in the 'Philosophical Magazine.'

In 1875 Rowland was invited to join the Faculty of the Johns Hopkins University. After a year spent in visiting the chief physical laboratories of Europe, he entered upon the duties of his professorship.

It was during this year, in Helmholtz's laboratory at Berlin, that Rowland made his well-known experiments, which appeared to show that an electrical charge, if carried at a high speed, has the same magnetic action as an electric current. Recently M. Crémieu has failed to obtain a similar result. The point is still under discussion.

Among Rowland's earlier work may be mentioned a re-determination of the ohm and the measurement of the ratio of the electrical units; also the electric absorption of crystals. His investigation on the subject of the mechanical equivalent of heat was crowned by a prize from the Venetian Institute, and by the award of the Rumford Medal by the American Academy of Arts and Sciences.

It was about 1881 that he turned his attention to Spectrum Analysis, with which his name will ever remain associated. He went at once to the bottom of the matter. Recognising that the perfection of the spectrum depended upon the accuracy of cutting of the gratings, and that the ruling of the gratings depended upon the dividing engine, and the dividing engine upon the screw, he set himself to devising a process of cutting a screw more nearly perfect in constancy in pitch than had hitherto been accomplished. In this task he was eminently successful.

He gave a full account of his methods in his article on the "Screw" in the 'Encyclopædia Britannica.' His great gift to science, introducing a new departure in the more accurate measurement of the spectral lines, was the creation of the concave grating. A mathematical investigation had shown him that a grating ruled on a spherical concave surface would have some distinctive and most important advantages. The spectrum could be maintained normal by a simple form of mounting, and would be always in focus along a certain line without the use of lenses. The spectrum would be astigmatic, and dust in the slit would no longer be a difficulty. Concave gratings were at once successfully made by him, with the almost immediate result of a great increase of accuracy in spectroscopy and its applications.

His direct contributions to Spectrum Analysis can scarcely be over-estimated. His grand photographic map of the solar spectrum, his tables of standard lines, solar and metallic, and his measurement of the arc spectra of the elements, are in constant use, and are of fundamental value.

During quite recent years Rowland turned his attention to the theory of alternating electric currents, and to their application to motors and measuring instruments; and in particular to a multiplex printing telegraph system, which achieved a great success at the Paris Exhibition of last year. He was elected a Foreign Member of this Society in 1889.

Once again the Fates cut the thread of a life prematurely, and a

man great in promise and great in his power of inspiring others has fallen. Viriamu Jones, Principal of the University College of South Wales, possessed of great natural powers, a man of high ideals, charming in his personality, inheriting much grace of diction, almost irresistible in his persuasiveness, in a true sense lived a long life, though he died at the early age of 45. His successes began early; at 16 he won a scholarship in Geology; prizes, medals, and other scholarships followed during his studentship at University College, London; and at 19 he took his degree with first-class honours. At Oxford, having obtained high honours in mathematics, and in the Natural Science School, he was elected Principal and Professor of Mathematics and Physics in Firth College, Sheffield. Two years later, at the early age of 27, he was chosen, over many older candidates, to the responsible post of the First Principalship of the University College of South Wales. Deep, as it may well be, is the gratitude of the College and of Wales to their first principal. Chiefly through his efforts and power of persuasion, £70,000 for the building of the new College, as well as a free site, were obtained.

His scientific work was mainly in electrical science, particularly in connection with Electrical Standards. In 1897 he worked out a simplification of his former methods and a more general solution of the problem discussed by him in 1888 of the mutual induction of a circle and a coaxial helix. The results are contained in a paper read before the Society in that year. He was a man of wide sympathies; he occupied many of his hours of relaxation from scientific work in studying the poetry of Robert Browning, who had been, at one time, an attentive listener in his father's congregation. His father was a man of rare gifts and eloquence, who was known as the Poet-Preacher of Wales.

Not prematurely, but not less to the profound regret of all who knew him, with the last century passed away a Fellow whose presence was familiar in these rooms, who had been on our roll for thirty-nine years, had served the Society for six years on the Council, and in 1876 and in 1889 was a Vice-President—Dr. William Pole.

His long and distinguished career as an engineer and a scientific adviser in this country and abroad, acting on several Royal Commissions, has already been fully written in the Obituary Notices. Dr. Pole was a man of exceedingly wide powers and sympathies. There is scarcely a subject in science and art in which he was not interested, and no subject which he cultivated that he did not adorn.

I cannot pass over his skill as a practical and theoretical musician. He took the degree of Bachelor of Music at Oxford in 1860, and proceeded to the degree of Doctor in 1867. He was elected an Honorary Fellow of the College of Organists. His elegant course of lectures at the Royal Institution, in 1877, in illustration of the applica-

tion to music of the acoustical discoveries of Helmholtz, and afterwards published under the title, "The Philosophy of Music," did not a little to advance the scientific study of music. An eight-part Motet on the Hundredth Psalm of his composition is well-known. He was for many years an Examiner in Music at the University of London.

In 1856 he presented a paper to the Society describing the peculiar sensations arising from a form of colour-blindness from which he suffered. He found time to write a work on the "Evolution of Whist," which still holds a prominent place in the literature of that game. Born in Birmingham on April 22, 1814, elected a Fellow in 1861, he died on December 30, 1900.

The work of the Society during the past year has been fully set forth in the Council's Report, which is already in your hands. To this Report I have but little to add.

On the 23rd February, I had the honour of taking part in a deputation to present to the King an address of condolence and of homage on the occasion of the demise of our late revered Sovereign and Patron, Queen Victoria. I was accompanied by the other officers, two of the Vice-Presidents, and by the former Presidents, Sir Joseph Hooker and Lord Kelvin. His Majesty received us in person at St. James's Palace, and made the following very gracious reply :—

"I am much gratified by the warm expression of your loyalty and affection, of your profound sympathy with our present grief and of your loving appreciation of the goodness and great qualities of my dearly beloved mother.

"I thank you for your dutiful good wishes, and I share your hope that my reign also may be blessed by a continuous growth of my people in enlightenment, refinement, and power for good.

"The intellectual attainments and energies which your Society so conspicuously represents are among the most precious possessions of the nation as aids in securing these high ends; and I remember with gratification the close connection of the Society with its Royal Founder and my other predecessors on this throne, and the fact that I am a Fellow as was also my dear father. You may feel assured of my constant interest in and protection of your work; and in token of my goodwill I shall be pleased to inscribe my name as Patron in the Charter Book."

The Charter Book of the Society was taken by the Assistant-Secretary to St. James's Palace on the 3rd May, and laid before His Majesty the King by the Secretary of State for the Home Department, when His Majesty was graciously pleased to sign his name as Patron on a page furnished for the purpose with an illuminated border.

In reply to a humble prayer presented to His Majesty that he would be graciously pleased to continue the annual gift to the Society of the

two Royal Medals, I received the following letter from the Keeper of His Majesty's Privy Purse :—

“I have had the honour to lay before the King your letter to me of the 16th instant, and am commanded to inform you in reply that His Majesty is pleased to comply with the request of your Council to continue the annual gift to the Royal Society of the two gold and two silver medals which the late Queen Victoria presented to the Society, and which medals were founded by His Majesty King George IV.”

As at the time of the death of Her Imperial Majesty, the Dowager Empress Frederick of Germany and Queen of Prussia, Princess Royal of Great Britain and Ireland, the Council was not in session, I considered it to be my duty to send to His Majesty, through the Home Secretary, on behalf of the Fellows, an address of respectful condolence and of appreciation of Her late Imperial Majesty's distinguished virtues and intellectual attainments, and especially of her enlightened encouragement of Science and Art. I received through the Home Office the assurance that His Majesty was pleased to receive this address of condolence very graciously.

As Fellows of this Society, our position to our brethren of the United States is closer than that we hold as Englishmen, for in addition to race and descent, and common aims and methods of thought, we have among our Foreign Members some of the most illustrious sons of the New World ; while on the other hand many of us have the honour of having been elected members of the scientific societies of America. I had no hesitation, therefore, that I should be carrying out your wishes in sending to the American Ambassador, on the occasion of the attempt on the late President's life, an address in the name of the Society, expressing our horror and detestation of the crime, our deep sympathy with the President, Mrs. McKinley, and the people of the United States, and our fervent hope for the President's speedy recovery.

I received, in reply, a telegram from Mr. Choate expressing his thanks, and stating that he had forwarded the address to his Government. When a few days later the sad news arrived of the President's death, I sent, in the name of the Fellows, a telegram of condolence and of sympathy with Mrs. McKinley and the American nation, at the loss of their distinguished and noble-hearted President. To this, the Ambassador replied by a telegram expressing his thanks to the Fellows of the Society for their words of sympathy.

I have to give expression to my deep regret, shared, I am sure, by every Fellow of the Society, that our Junior Secretary, Professor Rücker, who in the performance of the duties of his office during the last five years, has shown such faithful devotion to the interests of the Society, and zeal for the progress of Science, has found it necessary, in consequence of his election to the high position of

Principal of the new University of London, to retire from our service. It is no little satisfaction to us, and, indeed, some mitigation of our sorrow for our own loss, that a position of so high importance in connection with the encouragement and advancement of the scientific education of the future is to be held by a man as well known for his brilliant scientific attainments, as for his supreme devotion to scientific progress.

I rejoice that the Council is able to submit to your suffrages to-day, as Secretary, a man who, I can have no doubt, will carry on the high traditions of an office held in succession by Sir George Stokes, Lord Rayleigh, and Professor Rücker.

The Council have had under their consideration a matter of some importance to the internal working of the Society. Though the office of general Secretary is an annual one, there has not been any limit to the eligibility of a Secretary to re-election. Some of our Secretaries, to the great benefit of the Society, have thus by re-election filled the office during a long period of successive years.

Two Memorials, each signed by a number of Fellows, have been received by the Council. One Memorial is in favour of limiting the eligibility to re-election to the office of Secretary to a period of ten years; the other Memorial is in favour of leaving the office, as it has always stood, without any limitation of tenure.

The Council, after a very careful consideration of the arguments on both sides, resolved, though by a narrow majority, the officers preferring not to vote:—

“That, in the opinion of this Council, it is desirable that the Secretaries should not be so re-elected as to hold office for a period exceeding ten successive years, this resolution not to apply to the present holders of office.”

Since the foundation of the Royal Society, no small part of its external activities have been expended in promoting expeditions of discovery in ships; it was therefore fitting and in harmony with our traditions, that we should be willing to promote an expedition to improve our knowledge of the comparatively unexplored Antarctic regions.

An account of the preparations for this expedition, conjointly with the Royal Geographical Society, and of the instructions to the Commander and to the Scientific Director, drawn up by the joint Committee of the two Societies, will be found in the Council's Report. I may add here, in continuation, that the “Discovery,” after an inspection by the King and Queen, and a cordial farewell from their Majesties, sailed on August 7.

The arrangements on board provided for special departments of scientific work, are very complete. There is a carefully devised magnetic observatory, and laboratories for biological, chemical, and

physical work, together with an ample supply of instruments and apparatus. The ship takes out a captive balloon, from which much may be expected in the observation, and, to some extent, the survey of more extensive regions than would otherwise be possible; it may also be of use to aid in selecting out the most practicable routes for land exploration.

The "Discovery" left Madeira on August 16, and reached the Cape after a fairly prosperous voyage. Upon the whole the winds were not too favourable, being shiftiy and lighter than might have been expected, so that Captain Scott found it necessary to steam more than it was hoped would have been necessary. On account of the delay occasioned in this way, and especially from the fact that the speed of the ship was found to be slower under steam, as well as under sail, than was anticipated, she did not arrive at the Cape until some eight days after the time that had been arranged for. On account of this delay, and the probability of further delays before reaching Melbourne, Captain Scott, to avoid postponing the final departure of the ship from New Zealand, decided to sail direct to Lyttleton without touching at Melbourne.

This decision will enable him to stand to the southward before arriving in the longitude of Australia, for the purpose of making special magnetic observations in the vicinity of what has been supposed to be a focus of maximum magnetic intensity.

In consequence of this change of plan, Mr. Murray found it necessary to return home from the Cape, instead of continuing with the expedition as far as Melbourne.

From the course taken to secure the Trade Wind, the "Discovery" made the Island of Trinidad, where the Captain, some officers, and Mr. Murray landed. On this island, hitherto unknown to naturalists, Mr. Murray made a limited exploration, securing a small collection of objects, of which he will doubtless write a description.

As far as haste permitted, a certain amount of collecting was done with tow-nets. The collection has been brought home by the Director.

Captain Scott reports that the ship proves very stiff, and an excellent sea-boat. He considers that, taking all things into consideration, she has done as well as could be expected from a vessel of her type. It is a matter of serious regret, however, that the consumption of coal by the engines is greater than was anticipated.

Yesterday, the 29th, a telegram was received from Captain Scott, saying he had arrived at Lyttleton, and that all was well.

The Royal Geographical Society has undertaken the purchase and the fitting out of a relief ship, to be sent out with a further supply of coals and stores in the autumn of 1902, to the assistance of the "Discovery." A whaler of unusually stout build has been secured,

and it is hoped, if the funds can be obtained, that this relief ship, the "Morning," fully equipped and furnished with the necessary stores, will be ready next year to sail for the south.

I am sure that I express the universal feeling of the Fellows in saying how profoundly we sympathise with the brave men who are about to face grave and unknown dangers, and that from our hearts we wish them God-speed.

Notwithstanding the direct dependence of the improvement and the spread of Natural Knowledge upon the early development of the powers of the mind by right methods of education, there may exist a difference of opinion as to whether the Royal Society, in its corporate capacity, should actively intervene at the present time to promote the introduction into the schools of the country of improved methods of teaching. There can be no doubt, however, that to the individual Fellows of the Society the nation may rightly look for guidance in this important and urgent matter. The Society does indeed recognise its responsibility in respect of national education by the appointment of representatives to sit on the governing bodies of nine public schools. Their influence, however, is too small, as opposed to the traditions of the schools, to inaugurate any large measure of reform, either in the methods of teaching or in the course of education; they have to be content to urge the claims of science, as an outside subject, to a subordinate place in the general scheme of studies.

Considering the difficulties which would arise in connection with the present established examinations by any departure from the traditional course of studies, but little hope can be, I fear, entertained of reform originating from within.

It is noteworthy that the words of one of the most distinguished of the early Fellows of this Society are applicable to the present day. In 1675 Evelyn addressed to the Society the complaint that "at most schools there was a casting away of six or seven years in the learning of words only, and that, too, very imperfectly." What he asks for is, that a method should be established for infusing knowledge and language at the same time, so that school training should become a real apprenticeship in Natural Philosophy.

No doubt, during the last two centuries and a-half, some improvements in the methods of teaching, and some widening of the subjects taught, have come in, but to a large extent Evelyn's complaint still holds true.

What are primarily needed are improved methods of teaching languages and mathematics, as well for the sake of these subjects themselves, as to afford time for the early collateral study of such subjects as are fitted to develop the powers of observation, of inquisitiveness into the nature and relations of natural objects, and of reasoning therefrom.

It is, therefore, a matter for congratulation that a new section of the British Association for the Advancement of Science has been formed for the promotion of Educational Science, and under its auspices three Committees, under the chairmanship of Fellows of this Society, have been appointed; a Committee to report upon improvements which might be effected in the teaching of mathematics; a Committee to report on the influence of Universities and examining bodies on Secondary Schools; and conversely on the influence of the Schools on University requirements; and a Committee to report on the teaching of Natural Science in Elementary Schools.

I have restricted my words, as in duty bound in this place, to the importance of right methods of education for the "improvement of Natural Knowledge," but I may, perhaps, be permitted to add that as Englishmen, we must not forget that a national educational training directed to the improvement of the observational and reasoning powers is most urgently needed at the present time to fit men for all departments of national life, for success in our industries, and even in pure commerce; the only method of education, indeed, by which the coming generation can hope to be able to maintain England's place among the nations in the international competition of the future.

To the inauguration of the New Century has not been wanting a sign in the heavens. The so-called new stars are as rich in scientific interest as they are of rare occurrence. The spectroscope reveals a succession of cosmical changes in the source of the star's light of whatever nature that may be.

The star of this year, discovered by Dr. Anderson at Edinburgh in February last, makes the fourth or fifth bright temporary star, and indeed recalls in splendour Tycho's memorable star of 1572.

Like all new stars, it appeared suddenly in nearly full splendour from its birth. Forty-eight hours previously, Pickering's photographic plate showed that nothing so bright as a star of the eleventh magnitude existed at the place where the new star burst forth. At first between the second and third magnitude, it rose in less than two days to a splendour exceeding the first magnitude. As in the manner of its advent, so in its subsequent behaviour, it conformed to the traditions of former temporary stars; waning almost immediately set in, and it descended with some fluctuations of brightness, more or less of a periodic character, to about the sixth magnitude.

The star will remain memorable, because for the first time the spectrum of an earlier stage of a new star's career was caught, and was found to resemble that of an early white star. Within two days, the characteristic features of the spectrum of the Nova of 1892 began to show themselves, namely, the presence side by side, and therefore necessarily one or both shifted relatively to the other, of broadened

dark and bright lines of the same substance, especially of hydrogen. The dark bands of absorption being on the violet side of the corresponding bright lines.

If the bright lines be considered to be at their normal place, allowing for the small radial motion of the star, the shift of the dark bands, if produced by motion in a radial direction, would require us to attribute to the gas producing the absorption a velocity of approach of 700 miles per second relatively to the gas emitting the bright lines. According to Campbell the radial motion of the star has remained practically constant at the small velocity of a little more than 3 miles per second.

A remarkable phenomenon occurred in Nova Cygni and in Nova Aurigæ, namely, that at a certain stage of cooling, the bright lines peculiar to the gaseous nebulæ (and which are probably due to an undiscovered light substance which we may call *Nebulum*) made their appearance, and, together with the lines of helium and hydrogen, which are common to the nebulæ and early white stars, remained to constitute the latest stage of their spectra. Faithful to these traditions the new star of this year, as it waned, showed a similar incoming of the nebular lines.

Though, as in the case of Nova Aurigæ, the halo seen round the star with refracting telescopes is doubtless instrumental, some recent photographs taken in America with reflecting telescopes are of high significance, since they show that, though the Nova itself is practically stellar, it is surrounded with spirals of very faintly luminous matter, which are found to be expanding, as if from a motion of projection and repulsion from the star. The star itself has only a small radial motion of about three miles a second, and a proper motion of less than one second annually.

Several independent and very complete series of photospectrograms of the new star, supplementing each other, have been secured—in this country by Sir Norman Lockyer and by Father Sidgreaves, in Germany by Vogel and others, and in America by Pickering, by Campbell, and by Hale. The stellar drama is not yet over. I must not allow myself, therefore, to speak prematurely of the different hypotheses which have been suggested to account for the remarkable series of phenomena which a new star successively presents during this brilliant but brief stage of its life-history.

The total solar eclipse of the 18th of May last raised high hopes on account of the exceptionally long duration of totality. Unfortunately this favourable feature was to a great extent counterbalanced by the more or less imperfect atmospheric conditions prevailing at the different stations. The three English observing parties have, however, brought home results which will enable us to improve our

knowledge of some of the problems underlying the phenomena of a total solar eclipse.

Mr. Newall observed at Ayer Karoe on the east side of the Barisan mountains, in Sumatra. He obtained with a grating spectrograph photographs of the bright narrow crescent, both before and after totality. As these photographs were taken with high dispersion, and have come out very successfully, showing both dark and bright lines, we may expect from them an increase of our knowledge of the seat within the sun of the vapours respectively producing them, and of the relation of these vapours to each other.

With a polariscopic camera, Mr. Newall obtained a set of photographs affording distinct evidence of strong polarisation of the coronal light, and the means of measuring the relative proportion of the polarised part of the light in several of the coronal streamers.

Mr. Dyson fixed his station at Pulo Aoer Gadang on the west coast of Sumatra. He determined the duration of the totality to be 6m. 20.5s., which exceeds by 10s. the time given in the 'Nautical Almanac,' but agrees with a prediction by Dr. Downing, the director of the Almanac, based on a value of the mean semi-diameter of the moon, derived from a recent discussion of eclipse observations.

Mr. Dyson's photographs of the corona, on the large scale of 4 inches to the sun's diameter, show many details of interest, among others the smaller extension of the polar streamers round the sun's north pole than round the south pole; and a remarkable triple arch over a large prominence, resembling in appearance layers of cloud over an eruption. Some of his small-scale photographs show an extension of the corona of 77' from the sun's centre.

As Venus and Mercury, together with stars down to the 6th magnitude, come out upon his plates, it may therefore be concluded that any object as bright as the 4th magnitude would certainly have appeared on the plates, unless accidentally obscured by cloud. The absence of any such object is presumptive evidence of some weight against the existence of an intra-Mercurial planet.

In his photographic spectrum of the corona, no new lines have been discovered, though all the known lines are strongly shown. The chromospheric spectra contain, in the visible region, sixty lines between D and F, and in the ultra-violet, fifty lines between λ 3450 and λ 3296.

Mr. Maunder's observations were made at the Royal Alfred Observatory, Mauritius. He secured a large number of photographs of the corona on different scales and with different instruments. These show respectively much structural detail, or the fainter and more extended parts of the corona or streamers therefrom. In one case two chief rays extend to about half a degree from the moon's limb.

COPLEY MEDAL.

Professor J. Willard Gibbs, For. Mem. R.S.

The Copley Medal is awarded to Professor J. Willard Gibbs, a Foreign Member of this Society, for his contributions to Mathematical Physics.

Although Horstmann had demonstrated, between 1869 and 1873, the applicability of the mechanical theory of heat to the elucidation of the phenomena attending dissociation, J. Willard Gibbs was the first to apply the second law of thermodynamics to the exhaustive discussion of the relations between chemical, electrical, and thermal energy and capacity for external work. His great contribution to this subject appeared in the "Transactions of the Connecticut Academy" in two parts, the first in 1875 and the second in 1878. In this paper, which opens with a discussion of the criteria of equilibrium and of stability as applying to a material system, the conditions of equilibrium prevailing in both homogeneous and heterogeneous systems of gaseous, liquid and solid materials are considered in a highly generalised form; and it is shown by Gibbs that Deville and Troost's experimental values of the density of nitrogen peroxide at different temperatures, and Playfair and Wanklyn's results obtained with mixtures of nitrogen peroxide and nitrogen, can be interpreted quantitatively with the aid of his fundamental gas equation.

The most important result of Gibbs's work, from a chemical standpoint, is the so-called "Phase rule," the law which governs the general case of complete heterogeneous equilibrium. This law, which was developed theoretically, states that a system in complete heterogeneous equilibrium must be composed of at least n different molecular components if it consists of $n + 1$ different phases.

The application of the Phase rule has been repeatedly verified experimentally under a great variety of aspects. During the last few years the recognition of the law has led, amongst other important results, to a complete systematisation of our knowledge concerning dissolution of solid substances, the distribution of a solute between two immiscible solvents, and to the formation of double salts and of racemic, pseudo-racemic, non-racemic, and externally compensated substances. The Phase rule has also been applied with complete success by van't Hoff to the elucidation of the formation of oceanic salt deposits. In fact, Willard Gibbs's generalisation is applicable to all cases of reversible chemical interchange, and consequently to chemical change generally.

ROYAL MEDAL.

Professor William Edward Ayrton, F.R.S.

A Royal Medal is given to Professor Edward Ayrton, F.R.S., for his contributions to Electrical Science.

The services rendered by Professor Ayrton to science during the last twenty-seven years may be roughly grouped under two heads. He has carried out a large number of researches in pure physics, and he has taken a very prominent part in the development of the application of electricity to industry, which has been so remarkable a feature of the closing years of the nineteenth century. It is not here necessary to refer particularly to his researches, invention and inspiration under the second head. At all times he has been doing service under both heads. From 1873 to 1878, in Japan; from 1879 to 1884, at Finsbury; and from 1884 to the present time, at the Central College, Kensington, he has acted as Professor of Physics; he has arranged large laboratories, and through his own example in research he has inspired many students, who are now carrying out investigations of their own.

A large number of papers contributed, sometimes alone and sometimes in partnership with others, to the Royal Society 'Proceedings' and 'Transactions,' and other scientific publications, while belonging to the second group above mentioned, have greatly assisted in pure physics.

It is not out of place to quote a published remark of the late Professor Clerk Maxwell in reference to the work of Professor Ayrton and a colleague in Japan, that they had moved the centre of gravity of electrical science greatly eastward.

ROYAL MEDAL.

Dr. William Thomas Blanford, F.R.S.

The other Royal Medal is conferred upon Dr. William Thomas Blanford, F.R.S., for his work in connection with the "Geographical Distribution of Animals."

Dr. W. T. Blanford received his scientific education at the Royal School of Mines, and, after special instruction in the methods of geological surveying under Professor (afterwards Sir Andrew) Ramsay on the English Geological Survey, proceeded in 1855 to take up a post on the Geological Survey of India.

Between the years 1855 and 1868, when he was engaged in surveying different parts of India and Burma, he published a number of

valuable papers on Indian Geology, and upon Malacology and other branches of Natural History, based on observations made during his travels as a geological surveyor.

In 1868, he was appointed to accompany the expeditionary force under Lord Napier to Abyssinia in the capacity of Naturalist, and his observations on the geology and fauna of the country are published in a number of communications to scientific journals, and in his work, 'Observations on the Geology and Zoology of Abyssinia,' published in 1870.

Between 1868 and 1872, Dr. Blanford returned to his work on the Geological Survey of India, and as the result of his labours in Sind, Cutch, the Deccan, and other parts of the country, a number of memoirs dealing with Geology, Malacology, and Ornithology were published by him. In 1872, he was selected to act as Naturalist to the Persian Boundary Commission and the results of his observations appeared in a work, 'Eastern Persia, Vol. II, Zoology and Geology,' which was published in 1876.

Returning to India, he not only carried on the usual survey work, but, in conjunction with Mr. H. B. Medlicott, prepared the important 'Manual of the Geology of India,' 3 vols., 1879. In this work, a most valuable summary of the geological observations which had been made upon all parts of the Indian Empire is given with a discussion of the age and relationships of the formations of that vast district,

Since his return from India, in 1882, Dr. Blanford has been continuously engaged in Zoological and Geological researches. His memoirs on the rocks of India and Australia, which exhibit glacial conditions, and on kindred subjects, have been most valuable contributions to geological science. Equally important have been the two addresses on "Geological Nomenclature," and "The Permanence or otherwise of Ocean Basins," which he delivered in his capacity of President of the Geological Society, in 1889 and 1890. In the last-mentioned address he has laid down principles and established conclusions which have given a new aspect to the study of the geographical distribution of animals.

'The Fauna of India,' published under the authority of the Secretary of State for India in Council (8 vols., concluded in 1898), was edited by Dr. Blanford, who has contributed three volumes on Birds and Mammals. This work has been most favourably received by the scientific public, and is looked upon as the standard authority of Indian vertebrates. His contributions to this work constitute his special claim to a Royal Medal.

Dr. Blanford is one of the few men who are regarded as an authority on Geology, Palæontology, and Zoology, to each of which branches of science he has largely contributed.

DAVY MEDAL.

Professor George Downing Liveing, F.R.S.

The Davy Medal is awarded to Professor George Downing Liveing, F.R.S., for his contributions to Spectroscopy.

Professor Liveing's papers on spectroscopic subjects have been mainly published during the last quarter of a century in conjunction with Professor Dewar, and have appeared for the most part in the 'Proceedings' of the Royal Society. They make up a record of patient, accurate, conscientious labour, and, taken together, constitute one of the most valuable contributions to this department of chemical physics yet made by British workers.

SYLVESTER MEDAL.

Professeur Henri Poincaré, Foreign Member, R.S.

The Sylvester Medal, given this year for the first time, is awarded to Professeur Henri Poincaré, a Foreign Member of this Society, for his many and important contributions to Mathematical Science.

Professeur Henri Poincaré's mathematical writings display very great originality, independence of thought, and far-sightedness. The number of the memoirs and works which he has published is extraordinary, and the wide range of subjects in Pure Mathematics and its applications to Astronomy and Physics which they cover is equally remarkable. The bond of unity which connects his investigations is that nearly all have a more or less intimate connection with the study of Differential Equations. He has dealt with the theories of Linear Differential Equations, of Ordinary non-Linear Differential Equations, and of Partial Differential Equations, with striking results in each theory; and each is associated with a department of his other important researches.

In the theory of Linear Differential Equations, Fuchs had called attention to the substitutions by which different particular integrals are interchanged at the critical points. The substitutions form a group, and (at any rate, when the equation is of the second order) there exist automorphic functions which are unchanged by the operations of the group. M. Poincaré has constructed these functions, and shown how by means of them a complete integration of the linear differential equation can be effected ('Acta Mathematica,' t. iv). He has devoted five classical memoirs ('Acta Math.', i, iii, iv, v), to a profound study of the automorphic functions and Fuchsian and Kleinian Groups. Closely related to the same study are his delicate

researches as to the Topology of Loci in space of n dimensions, and a number of contributions to the theory of algebraic functions.

In the theory of ordinary differential equations (not linear) he has introduced a new method of dealing with the question of the existence of a solution, and has shown how various methods of approximating to a solution may be utilised for solving the problem which gives rise to the differential equation. This lies at the root of his investigations in connection with the Equations of Dynamics and the special problem of Gravitational Astronomy—that of n bodies. He has shown that G. W. Hill's periodic solution of the problem of three bodies is one of an infinite system. M. Poincaré has also discussed from the point of view of modern analysis, the methods of solution in periodic series which are associated with the name of Laplace, and with the problem of the stability of the Solar System, and has been led to give the first complete theory of series of the kind now called "Asymptotic," and to point out their uses in analysis.

Mathematical Physics requires the investigation of certain *partial* differential equations, and the problem arises to develop a formula from which the solution, subject to boundary conditions, can be calculated. The problem can in any case be reduced to the discovery of what is now called a Green's Function. To Poincaré is due perhaps the most feasible means yet devised for arriving at these functions. A general analytical theory has also been given by him of a somewhat different problem, required in theories of vibration and electrical oscillation. The Diffraction of Light has also been discussed by him in an elaborate memoir.

He has besides enriched Pure Mathematics with researches in the theory of numbers and on double integrals. In Applied Mathematics he has obtained remarkable results with regard to the figures which can be assumed by rotating fluid. To Dynamical Astronomy he has contributed not only memoirs, but a monumental work in three volumes—'Les Méthodes Nouvelles de la Mécanique Céleste.'

Finally, allusion may be made to the services which M. Poincaré has rendered to a number of branches of Mathematical Physics, by critical presentation of the work of others in published courses of lectures.

On the motion of Lord Lister, seconded by Sir William Crookes, a vote of thanks was accorded to the President for his address, with a request that he would allow it to be printed.

The Statutes relating to the election of Council and Officers were then read, and Dr. J. H. Gladstone and Dr. H. Woodward having been, with the consent of the Society, nominated Scrutators, the votes of

the Fellows present were taken and the following were declared duly elected as Council and Officers for the ensuing year:—

President.—Sir William Huggins, K.C.B., D.C.L., LL.D.

Treasurer.—Alfred Bray Kempe, M.A.

Secretaries.— { Sir Michael Foster, K.C.B., D.C.L., LL.D.
 { Joseph Larmor, M.A., D.Sc., LL.D.

Foreign Secretary.—Thomas Edward Thorpe, C.B., Sc.D.

Other Members of the Council.—Prof. Henry Edward Armstrong, LL.D.; William Bateson, M.A.; William Thomas Blanford, LL.D.; Prof. Frederick Orpen Bower, Sc.D.; Charles Vernon Boys; Prof. William Burnside, M.A.; Prof. William Watson Cheyne, C.B., M.B.; Prof. George Carey Foster, B.A.; Right Hon. Sir John E. Gorst, M.A.; Prof. William Mitchinson Hicks, M.A.; Prof. Henry Alexander Miers, M.A.; Prof. J. Emerson Reynolds, Sc.D.; Robert Henry Scott, Sc.D.; Prof. Charles Scott Sherrington, M.D.; Joseph Wilson Swan, M.A.; Prof. Herbert Hall Turner, M.A.

The thanks of the Society were given to the Scrutators.

INCOME AND EXPENDITURE ACCOUNT

GENERAL PURPOSES.

November 12th, 1900, to November 11th, 1901.

INCOME.				EXPENDITURE.			
	£	s.	d.		£	s.	d.
To Fees—				By Establishment Expenses—			
Admissions ...	10	0	0	Salaries and Wages	1,962	19	0
Compositions ...	240	0	0	Office Expenses	69	6	0
Annual Contributions, 251 at £3	1,085	0	0	House Expenses	262	2	8
83 at £4				Coal and Lighting	195	10	0
" Fee Reduction Fund	405	0	0	Fire Insurance	55	5	0
				Advertising	21	11	6
	1,740	0	0	Postages and Petty Charges	119	5	5
				Printing, Miscellaneous	189	11	9
Investments—				Tea Expenses	25	9	0
Rents...	667	0	7	Taxes...	24	8	0
Dividends and Interest	2,515	4	0	Law Charges	11	9	1
Income Tax Recovered	106	15	9	Soirées and Receptions	80	15	6
	3,289	0	4	Anniversary	15	1	0
				Miscellaneous	105	8	4
Publications—				Electric Plant, Inspection and			
Sales:				Repairs	26	7	0
"Philosophical Transactions"	527	0	10		3,164	9	3
"Proceedings" including					301	1	5
£24 6s. 0d., Sales of Colour							
Vision Report...	233	2	0	Library ...			
Malaria Publications	39	11	8	Publications—			
Other Sales	3	13	8	"Philosophical			
				Transactions—			
	803	8	2	Printing	783	8	7
Less Commission	75	8	3	Paper	267	15	0
				Engraving and			
	727	19	11	Lithography	473	13	3
Government, Publication Grant	1,000	0	0	Binding	56	19	2
					1,581	16	0
	1,727	19	11				

" Catalogue—					
Sales ...	...	14	7	1	
Transfer from Handley Fund ...	...	188	0	0	
" " Proceeds of Atlas Policy ...	...	375	0	0	
Index, Transfer from Dr. L. Mond's Gift ...	...	183	4	9	
		<hr/>			760 11 10
	Total Ordinary Income ...	<hr/>			7,517 12 1
" Balance, being excess of Expenditure over Income					
or year ...	...	...	...	...	293 18 9
" Proceedings" (in-					
cluding £133 12s. 0d.					
reprint of Colour					
Vision Report)—					
Printing ...	...	583	18	7	
Paper ...	...	172	2	6	
Engraving and					
Lithography ...	...	143	2	9	
Binding ...	...	1	9	6	
		<hr/>			900 13 4
Year Book ...	...				58 15 0
Record ...	...				30 16 0
		<hr/>			2,572 0 4
Grants for Extraneous					
Publications ...	...	250	0	0	
Do. not yet					
claimed... ..	...	221	13	4	
		<hr/>			471 13 4
					3 043 13 8
" Catalogue—					
Supplementary Volume to 1883 ...	...	1,027	15	0	
Volumes for 1884 to 1900 ..	...	88	18	10	
Index... ..	...	185	12	8	
		<hr/>			1,302 6 6

£7,811 10 10

£7,811 10 10

CASH ACCOUNT.

GENERAL PURPOSES.

November 12th, 1900, to November 11th, 1901.

RECEIPTS.		PAYMENTS.	
£	s. d.	£	s. d.
To Balance at Bank, 11th Nov., 1900—Deposit Account (Dr. L. Mond's Gift)	176 17 5	By Payments as per Income and Expenditure Account, excluding £221 13s. 4d. not paid during this year... ..	7,589 17 6
" Balance at Bank, Current Account... ..	1,478 1 4	" Other Payments, namely—	
" Balance in hand, Petty Cash	26 14 8	New Electric Light Installation (making with £35 14s. 0d. paid last year, a total of £501 17s. 11d.)... ..	466 3 11
" Receipts as per Income and Expenditure Account (excluding items of £375 and £238 3s. 10d. not received during this year)	7,114 8 3	Malaria Research	82 14 4
" Other Receipts, namely—		International Catalogue, Loan Account, further advances	2,065 4 2
Sale of £928 2s. 6d. India 3½ per cent. Stock	1,000 0 0	Carrington Gift	30 0 0
" £896 18s. 3d. do.	750 0 0	Publication Grants charged in last year's accounts now paid	125 0 0
" Malaria Research	139 19 10	Borchgrevink Antarctic Observations... ..	40 0 0
" Bank Account overdrawn, 11th November, 1901	143 17 1	Withdrawn from Deposit Account	176 17 5
		Coral Reef Committee, Advance for Funafuti Report	231 3 7
		" Balance on hand, Petty Cash	22 17 8
			<u>£10,829 18 7</u>
			<u>£10,829 18 7</u>

BALANCE SHEET.

GENERAL PURPOSES.

November 11th, 1901.

LIABILITIES.				ASSETS.						
£	s.	d.	£	s.	d.	£	s.	d.		
To Tsetse Fly Account, Grant unexpended as per last Balance Sheet ... late				By Cash in hand ...				22	17	8
Less Payment to the late Dr. Kanthack ...				" Tsetse Fly Report, to be repaid by Natal Government ...				117	4	2
25 0 0										
<hr/>										
23 3 3										
<hr/>										
" Carrington Donation—				" International Catalogue Loan Account—				£	s.	d.
Balance of Grant unexpended per last Balance Sheet ...				As per last Balance Sheet...				£	s.	d.
30 0 0				308 6 8				500	0	0
<hr/>										
60 0 0										
<hr/>										
" International Catalogue—				Printing Bill ...				6	17	6
Balance of Grant from Donation Fund unspent, as per last Balance Sheet ...				Further advance at 4 per Cent. ...				1,750	0	0
0 8 4				Interest thereon ...				28	3	10
<hr/>										
" Catalogue Account—				Malaria Research Grant—				£	s.	d.
Balance unapplied at date of last Balance Sheet ...				Balance unexpended, per last Balance Sheet...				59	5	8
800 0 0				Add Payments during year ...				82	14	4
<hr/>										
Less Transferred to Income and Expenditure Account for Catalogue ...				Less Repayments by Crown Agents				142	0	0
375 0 0				139 19 10						
<hr/>										
425 0 0										
<hr/>										
508 11 7										
<hr/>										
Carried forward ...				Carried forward ...				2,427	3	4
2 0 2										

BALANCE SHEET. GENERAL PURPOSES—continued.

LIABILITIES.		£	s.	d.	ASSETS.		£	s.	d.
Brought forward ...		508	11	7	Brought forward ...		2,427	3	4
To Catalogue Index—					By Coral Reef Committee, Advance for Funafuti Report		231	3	7
Amount of Dr. L. Mond's Gift not applied per last Balance Sheet ...		176	17	5	" Reducing Borzhgrevink Antarctic Observations, recoverable ...		40	0	0
Add Interest for year ...		6	7	4					
		183	4	9					
Less Transferred to Income and Expenditure Account ...		183	4	9					
" Publication Grant—									
Grants for Extraneous Publications not yet claimed, 1900		166	13	4					
" " " 1901		221	13	4					
" Bank Account overdrawn ...		388	6	8					
" Income and Expenditure Account—		143	17	1					
Balance as per last Balance Sheet ...		703	8	3					
Deduct New Electric Light Installation... ..		501	17	11					
		201	10	4					
Add Proceeds of Sale of £1,625 0s. 9d. India 3½ per Cent. Stock to advance to International Catalogue		1,750	0	0					
		1,951	10	4					
Less Excess of Expenditure over Income for the year		293	18	9					
		1,657	11	7					
		£2,698	6	11			£2,698	6	11

ESTATES AND PROPERTY OF THE ROYAL SOCIETY

GENERAL PURPOSES.

Estate at Mablethorpe, Lincolnshire (55A. 2B. 2P.), rent £75 per annum.	
Ground Rent of House, No. 57, Basinghall Street, rent £380 per annum.	
" of 23 houses in Wharton Road, West Kensington, rents £253 per annum.	
" Fee Farm Rent, near Lewes, Sussex, £19 4s. per annum.	
Stevenson Bequest. Chancery Dividend. One-fourth annual interest on Balance of Bequest still in Court. (This year, £90 3s. 2d.)	
£15,200 Mortgage Loan, 3½ per Cent., to the Duke of Norfolk.	
£3,518 0s. 3d., 2½ per Cent. Consolidated Stock in Charity, arising from sale of the Coleman Street Estate.	
£1,374 19s. 3d. India 3½ per Cent. Stock.	
£1,300 India 3 per Cent. Stock.—(Earl of Derby's Bequest).	
£592 5s. 9d. Midland Railway 2½ per Cent. Perpetual Guaranteed Preference Stock.—(Stevenson Bequest).	
£5,000 Madras Railway Guaranteed 5 per Cent. Stock.	
£2,725 Great Northern Railway 4 per Cent. Perpetual Preference Stock.—(Stevenson Bequest).	
£14,908 London and North Western Railway 4 per Cent. Consolidated Guaranteed Stock.—{ £12,150 General Purposes.	
£5,000 " " " Consolidated 4 per Cent. Preference Stock.	" " " (£2,758 Stevenson Bequest).
£5,000 North Eastern Railway 4 per Cent. Preference Stock.	
£2,760 " " " Consolidated 4 per Cent. Guaranteed Stock.—(Stevenson Bequest).	
£3,333 London and South Western Railway 4 per Cent. Preference Stock.	
£4,000 Southern Mahrattia Railway 4 per Cent. Debenture Stock.	

The Cassiot Trust.

£10,000 Italian Irrigation Bonds.

£500 2½ per Cent. Consolidated Stock.

	£	s.	d.		£	s.	d.
To Balance	By Payment to National Physical Laboratory ...	...	433	4 6
" Dividends	" Purchase of £500 Italian Irrigation Bonds ...	...	550	1 0
" £500 Bonds drawn	" Expenses of New Coupon Sheets, Irrigation Bonds ...	...	15	3 3
" Income Tax recovered	" Balance ...	...	208	3 6
						£1,206	12 3

Handley Fund.

£4,798 Lancashire and Yorkshire Railway 4 per Cent. Guaranteed Stock.

	£	s.	d.		£	s.	d.
To Dividends	By 'Transfer to Catalogue Account	...	188	0 0
" Income Tax recovered			£188	0 0

The Jodrell Fund.

£5,182 14s. 10d. 2½ per Cent. Consolidated Stock.

	£	s.	d.		£	s.	d.
To Dividends	By 'Transfer to Donation Fund	...	139	6 1
" Income Tax recovered			£139	6 1

Fee Reduction Fund.

£5,100 Metropolitan 3½ per Cent. Stock.
£9,533 London and North Western Railway 3 per Cent. Perpetual Debenture Stock.

	£	s.	d.	£	s.	d.
To Balance	405	0	0
Dividends	213	7	0
" Income Tax recovered	79	3	2
				<u>£697</u>	<u>10</u>	<u>2</u>
By Transfer to Royal Society General Account ...						
" Purchase of £200 London and North-Western Rail- way 3 per Cent. Debenture Stock at 105½ ...						
" Balance ...						
				<u>£697</u>	<u>10</u>	<u>2</u>

Darwin Medal Fund.

£2,500 South Eastern Railway 4 per Cent. Debenture Stock.
£195 South Eastern Railway 3 per Cent. Debenture Stock.

	£	s.	d.	£	s.	d.
To Balance
Dividends	100	0	0
" Income Tax recovered	199	2	0
				<u>£412</u>	<u>14</u>	<u>1</u>
By Silver Medal—Prof. E. Haeckel ...						
" Gift ...						
" Purchase of £195 South-Eastern Railway 3 per Cent. Debenture Stock at 101 ...						
" Balance ...						
				<u>£412</u>	<u>14</u>	<u>1</u>

Joule Memorial Fund.

£1,000 London, Brighton, and South Coast Railway Consolidated Guaranteed 5 per Cent. Stock.
£47 13s. 2d. 2½ per Cent. Annuities.

	£	s.	d.	£	s.	d.
To Balance
Dividends	100	0	0
" Income Tax recovered	35	16	7
				<u>£135</u>	<u>16</u>	<u>7</u>
By Grant to Dr. Ulrich Behn ...						
" Balance ...						
				<u>£135</u>	<u>16</u>	<u>7</u>

Brady Library Fund.

£330 2½ per Cent. Consolidated Stock.

	£	s.	d.	£	s.	d.
To Balance	60 11 9	...	...	48 18 2
" Dividends	8 5 2	...	...	20 3 6
" Income Tax recovered	- 4 9	...	...	...
			<u>£69 1 8</u>			<u>£69 1 8</u>

Gunning Fund.

£1,015 3s. 6d. Nottingham Corporation 3 per Cent. Redeemable Stock.

	£	s.	d.	£	s.	d.
To Balance	109 11 10	...	...	...
" Discharge of £1,000 4 per Cent. Bond of his Excellency, the late Dr. Gunning	1,000 0 0	...	...	1,000 0 0
" Interest	69 1 6	...	...	178 13 4
			<u>£1,178 13 4</u>			<u>£1,178 13 4</u>

Buchanan Medal Fund.

£258 9s. 2d. Metropolitan 3 per Cent. Stock.

	£	s.	d.	£	s.	d.
To Balance	23 9 1	...	...	...
" Dividends	7 6 4	...	...	31 0 2
" Income Tax recovered	- 4 9	...	...	...
			<u>£31 0 2</u>			<u>£31 0 2</u>

Sylvester Medal Fund.

£795 16s. 5d. Local Loans 3 per Cent. Stock.

	£	s.	d.		£	s.	d.
To Balance ...	64	15	9	By Purchase of £795 16s. 5d. Local Loans 3 per cent. Stock at 99 ...	788	18	3
" Balance of Fund and Interest received from Lord Rothschild ...	819	1	4	" Law Charges ...	22	3	6
" Interest ...	16	18	3	" Cost of Transfer of Stock ...	2	4	9
				" Balance ...	87	8	10
	<hr/>				<hr/>		
	£900 15 4				£900 15 4		
	<hr/>				<hr/>		

Hughes Medal Fund.

£2,099 13s. 8d. Bath Corporation 3 per Cent. Stock.
 £2,022 14s. 1d. Local Loans 3 per Cent. Stock.

	£	s.	d.		£	s.	d.
To Balance ...	44	6	7	By Power of Attorney ...	1	1	6
" Dividends ...	116	19	5	" Balance ...	160	4	6
	<hr/>				<hr/>		
	£161 6 0				£161 6 0		
	<hr/>				<hr/>		

BALANCE SHEET
TRUST FUNDS.
November 11, 1901.

		ASSETS.	
		£	s. d.
LIABILITIES.	To Bakorian and Copley Medal Fund ...	86	18 2
	" Brady Library Fund ...	20	3 6
	" Buchanan Medal Fund ...	31	0 2
	" Croonian Lecture Fund ...	19	5 2
	" Darwin Medal Fund ...	112	13 1
	" Davy Medal Fund ...	52	19 9
	" Donation Fund... ..	854	16 2
	" Fee Reduction Fund ...	79	3 2
	" Gassiot Trust Fund ...	208	3 6
	" Gunning Fund ...	178	13 4
	" Hughes Medal Fund ...	160	4 6
	" Joule Memorial Fund ...	35	16 7
	" Keck Bequest	—	
	" Mackinnon Studentship Fund ...	448	18 1
	" National Physical Laboratory ...	2,342	18 4
	Rumford Fund	61	12 10
	" Scientific Relief Fund... ..	588	3 5
	" Sylvester Medal Fund ...	87	8 10
	" Winttingham Fund ...	32	5 1
		£5,401	3 8
		£5,401	3 8

A. B. KEMPE,
Treasurer.

We, the Auditors of the Treasurer's Accounts on the part of the Council, have examined the above Accounts (except those of the National Physical Laboratory, which are to be separately audited), and have found them correct.

ROBERT H. SCOTT.
M. FOSTER.
C. V. BOYS.

We, the Auditors of the Treasurer's Accounts on the part of the Society, have examined the above Accounts (except those of the National Physical Laboratory, which are to be separately audited), and have found them correct.

W. J. RUSSELL.
P. A. MACMAHON.
A. D. WALLER.

The following Table shows the progress and state of the Society with respect to the number of Fellows as at November 30, 1901 :—

	Patron and Royal.	Foreign.	Com- pounders.	£4 yearly.	£3 yearly.	Total.
Nov. 30, 1900 ..	3	47	122	85	243	500
Since Elected ..	..	+ 1	+ 3	..	+ 12	+ 16
Transferred ..	..	..	+ 1	— 1	..	..
Since Deceased ..	— 1	— 4	— 3	— 1	— 5	— 14
Nov. 30, 1901 ..	2	44	123	83	250	502

ACCOUNT OF GRANTS FROM THE DONATION FUND IN 1901.

	£	s.	d.
Dr. Gamgee, F.R.S., to complete researches on the Photo-graphic Spectra of Hæmoglobin.....	25	0	0
Prof. Karl Pearson, F.R.S., for the purchase of head-spanners for the measurement of the heads of school children	10	0	0
Prof. Ray Lankester, F.R.S., in aid of the expenses of preparing the plates of a paper on <i>Eurolopus</i> for the Transactions of the Linnean Society.....	38	0	0
Dr. H. Gadow, F.R.S., to assist him in the zoological exploration of certain regions of Mexico	150	0	0
Dr. A. Gamgee, F.R.S., in aid of his researches on the Physico-chemical Properties of Hæmoglobin	50	0	0
Dr. L. Bernacchi, expenses of reducing the Meteorological and Magnetical Observations of the "Southern Cross" Antarctic Expedition.....	40	0	0
Royal Geographical Society, contribution to the Antarctic Expedition Relief Ship Fund	500	0	0
Lord Armstrong Memorial Fund	10	0	0
	<u>£823</u>	<u>0</u>	<u>0</u>

OBITUARY NOTICES OF FELLOWS DECEASED.

SIR ANDREW CLARK, BART. 1825 (?)—1893.

THE long delay which has occurred in the appearance of an obituary notice of our distinguished Fellow, Sir Andrew Clark, has been due in part to the hope that the promised volume of his biography might be available for our sketch. It has, however, not yet appeared, and we must not wait for it any longer.

Sir Andrew Clark was born in Aberdeen about the year 1825. His parents both died when he was very young. He had never known them, and, curiously, he went through life in the belief that he was a year or two younger than his real age. It is possible, indeed, that the discrepancy was greater than is suggested, for if his birth be placed in 1825 instead of 1826 (as he thought) it still makes him only 19 at the time that he obtained the diploma of the London College of Surgeons. The age of 21 is required at this College by statute. Sir Andrew died on November 6, 1893, having then, presumably, reached the age of 68 or 69. His death was caused by a stroke of apoplexy, which took him whilst in the full enjoyment of health and mental vigour. He was at the time of his death President of the Royal College of Physicians, and also of the foremost Medical Society in London—the Royal Medical and Chirurgical. To his duties in connection with these presidencies, and more especially with the first, a large share of his time and energies during the last few years of his life had been devoted.

He received his medical education partly at Dundee and in part at Edinburgh, and he held various appointments as assistant to his professors at a very early age. Soon after obtaining his diploma he entered the Navy, and was engaged at Haslar Hospital for seven years, chiefly in pathological work. At this period of life he was in delicate health, was considered phthisical, and was sent, on leave of absence, to Madeira. At Haslar he married his first wife, whom he lost a few years later. Having been engaged chiefly in pathological and museum work at Haslar he was induced, at the age of 28, to transfer his energies to the Medical School of the London Hospital, and in the following year was elected Assistant Physician to the hospital itself.

He now commenced practice in London. It was not until ten years later that his great success came. His reputation and his practice had been slowly but steadily increasing, when, at the age of 41, he suc-

ceeded to the post of full Physician to the hospital. This at once enlarged his sphere as a teacher. In the same year the last great epidemic of cholera in London occurred, and the wards of the hospital were crowded with patients. His zeal and assiduity in connection with this outbreak and his unsparing devotion to his patients secured him the good opinion and friendship of Mrs. Gladstone, and, subsequently, of her illustrious husband. Through their influence, backed by his own sterling merits, his professional connection was soon very widely extended. At the age of 44 or 45 he removed to a commanding residence in Cavendish Square. Here he lived the whole of the remaining twenty-three years of his life, immersed in occupations which he enjoyed, but which were of the most laborious and exacting kind. He had married for the second time at the age of 33, and he left a son and daughter by his first wife, and one son and three daughters by his second.

Sir Andrew Clark was a man of most attractive personality who endeared himself to all who knew him. His love of work, his zeal in investigation, and his devotion as a teacher were unbounded. Although never really in strong health, and obliged to live strictly by rule, he could endure without obvious fatigue an amount of work which would have been impossible to most men. It was a matter of unceasing regret to him that the absorption of his time in private and hospital practice prevented him from cultivating, as he would have liked, the more strictly scientific aspects of his profession. His friends were accustomed to hear frequent expressions of his determination to relinquish practice and devote himself to investigation; the time, however, never came. So high was his estimate of the functions of a teacher that long after his practice had become such as to demand all his time he was most punctual in his attendance at the London Hospital, and he retained his post of physician as long as the rules of the Institution allowed him to do so.

Although Sir Andrew was not the author of any epoch-making book, and no great discovery claims his name, yet his influence on the medical profession and on medical science was great. He had assumed the vocation of a teacher at a very early age, and in every appointment which he held he was unwearied in the lecture-theatre. His enthusiasm in his subject and his flow of appropriate language gave to his lectures a charm which always secured him a crowded and attentive audience. His gift seemed to lie rather in oral instruction than in written works, and it is precisely this kind of power which it is the most difficult to estimate. He was, moreover, a most fluent speaker, whether in lecture or conversation; but he was a fastidious writer, and did not like to permit any hasty composition to go forth under his name. The leisure for quiet composition was never his. Thus it has come about

that neither our own Society's 'Transactions,' nor those of the medical associations with which he was connected, can boast of many papers by him. The medical journals of the day occasionally secured a lecture by the aid of a reporter, but only very seldom did anything appear which was actually written out by himself.

The subjects with which the name of Sir Andrew Clark are chiefly associated are "Fibroid Phthisis," "Renal Inadequacy," and "Catheter Fever"; but the range of his interest was unbounded. To the first volume of the 'London Hospital Reports' he contributed, under the characteristic title of "Gleanings from the Field of Observation," a series of notes on very varied clinical topics.

At the time of his death, Sir Andrew was at the zenith of his fame, and was acknowledged by all as the leading physician of the Metropolis. He had throughout his career been very liberal, not only in gifts of money but in the bestowal of his time without recompense.

Sir Andrew's portrait was painted by Mr. Frank Holl and presented to him as a gift from a large circle of friends. It is now in the National Portrait Gallery.

The new pathological theatre at the London Hospital has been inscribed to Sir Andrew Clark's memory, and it was in part built by a special fund collected in order to provide some fitting memorial of him.

It is a pleasant fact to be kept in memory by his friends that his last consultation, that during which his apoplectic seizure occurred, was a gratuitous one. He was engaged with a lady in discussing a work of charity when the call to cease from all work came to him.

J. H.

EMIL DU BOIS-REYMOND. 1818—1896.

"With intellectual leanings impelling me in almost equal degree in various directions of natural knowledge, it has been my fate as an investigator to devote my endeavours almost exclusively to a single and, apparently, quite limited province. I was 22 years old when Johannes Müller set before me the question as to the nature of Nobili's frog-current, and now, after the lapse of 34 years, I am still searching for the answer to that question."

Thus wrote du Bois-Reymond in 1875, and the search was pursued for yet another 20 years.

Born in Berlin in 1818, educated partly in Berlin partly in Neuchâtel, he owed much to the foresight of his father, who, as du Bois himself relates, "had the goodness, in spite of his slender means, not

to press his son into practical life, but enabled him to devote himself to the study of animal electricity."

At 22 years of age (1840), having completed his medical curriculum, he became Müller's assistant and embarked at once upon what proved to be his life-work. At the end of his first seven years' service (1848) the first volume of the '*Untersuchungen über Thierische Elektrizität*' was published; in the next year the second volume appeared, breaking off, however, in the middle of a sentence, of which the concluding words did not see the light until 1884. The pause of 35 years is of itself an eloquent commentary upon the care and patience of the student, and it was a busy pause—how busy we may best realise from du Bois-Reymond's own apology and justification.

"The multiplier with its double needle was soon completely displaced by the reflecting galvanometer. Platinum electrodes in salt solution gave way to amalgamated zinc in zinc sulphate; albumenised membranes to modelling clay. Unpolarisable electrodes made it possible to map out lines of current and of potential in animal electromotors with greatly increased exactitude, and to apply exciting currents to the tissues with far less fear of fallacy. The dreaded inequalities of action at the metallic ends of the multiplier, that cost me such long hours of fruitless struggle, lost all their terror. Such slight inequalities as were still encountered were annulled by a twig of current; and by the compensation method electromotive forces came to be measured like cloth by the yard. Their exact numerical measurement took the place of rough estimations of current-strength. The aperiodic magnet not only facilitated galvanometric observations to a degree that was hardly realised outside electro-physiological laboratories, but actually brought within range many otherwise inaccessible questions. Not to mention the facilities afforded by various accessory instruments—keys, rheochord," &c.

And to us of the newer generation—whether we agree or disagree with the theoretical conceptions that were the impelling force of du Bois-Reymond's patient endeavours—not the least of his services have been these very real and positive achievements in the dull field of preliminary grovelling. We cannot criticise his conceptions except by means of the weapons he has himself fashioned and placed in our hands.

As every student knows, the discoveries of du Bois-Reymond are of fundamental importance; he was the first to give definite proof that active muscle undergoes chemical alteration, and that both muscle and nerve undergo alterations of their electromotive properties during physiological activity. It is certainly no exaggerated estimate of du Bois' share in the evolution of animal electricity—born 50 years before in the Casa Galvani at Bologna—to say that he has been the

active hinge round which the entire subject has been turned from an empirical to a rational aspect. And we shall hardly be guilty of injustice to either his predecessors or his successors in the field if we regard the historical development of animal electricity as falling naturally into two volumes—a volume before du Bois-Reymond and a volume after du Bois-Reymond.

But this estimate of his place in Science, considerable as it is, and none the less considerable in that this "*torso*," this "*monstrum per defectum*," as he somewhat mournfully characterises the 'Thierische Elektrizität,' never fulfilled the ideals of the young and zealous student, is the smallest part of the man himself. He was the last of the encyclopædists, yet a man of strenuous simplicity, a fervent preacher of the broad gospel of "the mother of the sciences," less to the limited circle of professed scientists than to the wide audience of thinkers, whether in science or in law or letters, that are the brain of the German body. The authoritative weight of his voice was in this respect unique, and was the outcome of a concurrence of tributary qualifications—qualifications of blood, of character, of training, of family circumstances, and of official circumstances.

Sprung from a Huguenot stock, and bred chiefly in Berlin, he was a happy blend of German thoroughness with French keenness. With four languages at command, German, French, English, and Italian, he spoke and wrote German with a clearness and elegance that—joined to the fact that whenever he spoke and wrote, he gave expression to his own mind—rendered him a writer and orator of the first rank, second indeed to none of his contemporaries. And by the influence thus acquired, he was enabled to advance the material interests of Physiology, while he contributed in no small measure to the education of scientific taste, which in Germany as in England was wont to be silenced by the more showy claims of literature and of art. The cluster of Institutes, of which the Physiological Institute forms part, and which to-day is still among the finest in Europe, was the direct outcome of du Bois' personal influence with the Emperor of Germany; and in connection with the lecture theatre of the Institute a private box for the accommodation of royalty signifies an interest which, when not embarrassing, may be of considerable value to the advancement of science.

After 18 years' service as assistant to Müller (in 1858) du Bois-Reymond succeeded his master in the chair of Physiology. Nearly 20 years later (in 1877) the new Institute of Physiology, of which he remained the active head for a further period of nearly 20 years, was completed. Thus du Bois-Reymond's public career extends over nearly 60 years, in three periods of 20 years each—a first period as Müller's assistant, a second period as Müller's successor in the incon-

venient laboratory of the old University building, a third period as Director of the palatial Institute that he had urged into existence. As a student of animal electricity, his activity was greatest during the first period, which saw the publication of the 'Thierische Elektrizität.' During the second and third periods, his duties as Secretary of the Berlin Academy of Sciences, as Editor of the 'Archiv für (Anatomie und) Physiologie,' and as President of the Physical and of the Physiological Societies, absorbed a large share of his time. From first to last the delivery of his official course of lectures on Physiology was a first charge upon his energies, and he spared neither time nor trouble to maintain these lectures at their high intellectual level. The more popular utterances to which from time to time he was bound by official usage, and which are collected in two volumes, are marked by literary excellence and broad learning. Among these essays perhaps the most important were that upon the "Limits of Natural Knowledge" (1872), concluding with his celebrated and much-criticised "Ignorabimus," and the sequel eight years later published under the title of the "Sieben Welträthsel," and concluding with less quoted but hardly less misunderstood "Dubitemus." In these essays, du Bois-Reymond speaks to the great thinking public as the exponent of positive science, and in natural and inevitable reaction from the "vitalistic" standpoint of Müller, takes up a philosophic position of which "materialistic" is the most frequently chosen adjective. He did so in common with his three great contemporaries, Helmholtz, Brücke, and Ludwig, and with them helped to introduce into physiology further (but not final) physical and chemical analysis.

But perhaps the essay which was most striking and characteristic of the man himself in the full vigour of his maturity is the philippic which he delivered as Rector of the University on August 3, 1870, the day before Wissembourg, and just six weeks before Sedan.

" But this Richard III is nearing his field of Bosworth, and the day is preceded by the haunted night Yet let us leave him who is but a passing shade. There is another indictment to be drawn up. Louis Napoleon has an accomplice. I do not speak of his pitiful tools, of those strangers, dukes, and chancellors who lie for him to-day as they will counter-lie against him to-morrow. The criminal whom I arraign, more dangerous than Louis Napoleon himself, because imperishable, is the whole French nation. I proclaim this aloud from the tribune of the premier German University, to be whose mouthpiece at this historical pass I prize as highest honour. I call upon the French people to hear and understand how sentence is passed upon its present state, not merely by the pens of journalists, or the gossip of boon companions, or the limited patriotism of young braves, but by the deliberate judgment of a learned body which con-

sists of most serious, most honourable, and most impartial men—of our most distinguished German teachers and scholars. Myself, of almost pure Celtic blood, half French by education, I pronounce these words with deepest pain, for the roots of my intellectual life spring in large measure from French soil. All the more do I feel it to be my right and my duty to speak as I shall speak, since my almost international position can but increase the weight of my words in the minds of all clear-thinking Frenchmen.”

This war-speech gave great and enduring offence, which, however, was justified less by the general tenor of the speech, which was at the same time severe and respectful, than by the partial and twisted quotations of it that appeared in the Paris journals. Du Bois-Reymond, Rector of the University of Berlin, knew and appreciated better than most men the strengths and weaknesses of the French nature. And in that sense, although a Berliner, he was a good Frenchman, just as, although bearing a French name, he was a good German.

Among the biographical essays from du Bois-Reymond's pen two in particular have permanent historical value and interest, the first dealing with the career of Johannes Müller, the last—which was also the last act of his life—giving us a most living and dramatic picture of his great fellow-student Helmholtz. Thus it fell to du Bois-Reymond to turn the first and the last pages of what will in time to come stand out as one of the most vigorous chapters in the life-history of physiology, the second half of the nineteenth century, a period deeply scored by the names of four great men—Ernst Brücke, Karl Ludwig, Hermann Helmholtz, Emil du Bois-Reymond.

A. D. W.

SIR GEORGE HUMPHRY. 1820—1896.

Sir George Murray Humphry was born at Sudbury, in 1820, of a family of some distinction in Theology, Law and Medicine. He died September 24, 1896. At the age of 16 he was apprenticed to Mr. Crosse of Norwich. In 1839, he went to St. Bartholomew's, where he won the gold medal in Anatomy. In 1840, he won the gold medal of the London University for Anatomy and Physiology; and honours in Chemistry. At the age of 22 he was recommended by James Paget to George Paget for a vacancy on the Honorary Staff of the Addenbrooke's Hospital, and in due course he became a graduate of the University in which he was afterwards to play a considerable part. One of his first steps was, in conjunction with George Paget, to obtain leave to give clinical lectures at the Hospital. In 1847, Professor Clark deputed to Humphry the part

of Human Anatomy in his course, and from the beginning his lectures attracted attention for their breadth and lucidity. In 1866, sixteen years after Humphry's arrival at Cambridge, Clark resigned the Chair of Anatomy, and a Chair of Human Anatomy was founded separately; to this chair Humphry was elected, and for seventeen years he held it with great distinction. Being then desirous of resigning the teaching of anatomy, which under his hands had grown into a very large department, a Chair of Surgery was founded, without stipend and terminable at his death, in order to do him honour as one of the leaders in the reform of the Faculty of Medicine in Cambridge; and in recognition of his remarkable powers, both as a teacher in the School of Anatomy and as a skilful and enthusiastic clinical surgeon. In 1891 he received the honour of knighthood.

As an anatomist, and especially as a surgical anatomist, his perseverance and devotion were such as distinguish only the greatest men of his calling. This is not the place to tell any of the stories current among his old pupils of the keenness, resourcefulness and indefatigable tenacity with which he would follow up a case which had interested him; and he rarely missed his reward, and the enrichment of science, in the addition of some material record of it to the Museum of Surgical Anatomy, which henceforth will be known by his name. Thus it was that perhaps no surgeon of his time, unless it were James Paget, had so great a wealth of experience on which to draw for the illustration of surgery. Yet by this wealth he was never embarrassed in his teaching; dogmatic enough to fix the attention of the student, he was yet so full of life and play of thought that the student was as much interested in the processes of his thought as in the results expounded. Moreover, a facility of expression, of epigrammatic point, and of pertinent illustration, gave a vividness to his lectures which none of his pupils forget. Of no clinical teacher perhaps are so many "sayings" still quoted. In presence he was no less remarkable; it is hard now to imagine the streets of Cambridge without a vision of that keen face and slender frame, worn, as it were, by incessant activity of mind and body. In private life his influence was no less attractive; closely occupied as he was by his profession, he retained, nevertheless, to the end of his life, a curiosity and openness of mind towards all and any subjects of scientific or literary interest, which made him a stimulating and interesting companion. The subtlety of his mind indeed, and a certain defect in judgment of individual character which is common in men of his masterful and eager nature, laid him open sometimes, especially in his earlier days, to strong and even bitter opposition. With Paget and Michael Foster, Humphry had a leading part to play in the resurrection, or indeed the creation, of the Medical

Faculty as a great department in Cambridge; to this end his masterfulness of character was essential, and, if at times his subtlety and pertinacity were resented, his courtesy and vivacity of manners, his humour and persuasiveness as a public speaker, the purity of his motives, the loftiness of his purpose, and his attractive personal qualities, at any rate in his later years, disarmed all opposition and animosity. Of his contributions to medicine, reference may be made to his book on "Old Age," published in 1889; and to the article on 'Tetanus' in Allbutt's "System of Medicine," written shortly before his death.

It is, however, upon his contributions to Anatomical Science, which were numerous and valuable, that Humphry's scientific reputation chiefly depends. His first and largest work, "The Human Skeleton," published in 1858, was a record of original observation and research; indeed in its day it was the most remarkable book on the subject, and on almost every page it shows the care and pains that had been expended in its production. He was one of the first to observe that the cancelli in each bone show a definite arrangement of their lamellæ, and to point out the practical importance of this in the mechanics of the skeleton. His tables showing the relative lengths of the long bones in different races, embodying much laborious work done by himself, were the earliest researches in this branch of physical anthropology.

In the department of Muscular Anatomy he published an important series of descriptive papers, the records of his dissections of animals; and from this ontological material deduced certain general principles in muscle-morphology. His results are interesting; as in some respects, such as the mode of delamination of the somatic musculature, he was led to conclusions which have been confirmed on other grounds. His morphological views, both in the study of the bones and muscles, were based on ontology rather than on embryology; and his views on homology were largely, though not slavishly, founded on those of Owen.

The furtherance of Anatomical Science always occupied a prominent place in his thoughts: in 1866 he had, in connection with Sir W. Turner, started the "Journal of Anatomy and Physiology," of which for some years he was an active editor. About twenty years later he took a leading part in the organisation of the Anatomical Society, of which he was the first President.

It should be remembered that all this work was done while he was engaged in a large and laborious practice in the Eastern Counties. Yet even to the last his interest in the advancement of anatomical science never flagged. He had lively memories of the way in which

the importance of anatomy had been impressed upon him at the threshold of his professional study by his master, Crosse of Norwich, who had himself been in his youth a favourite pupil of Macartney, and afterward a demonstrator in the Dublin School before he settled in Norwich. It was, therefore, with a sort of filial affection that Humphry regarded the Macartney specimens which formed the greater part of the Cambridge Museum when he became Professor in the University.

T. C. A.

SIR JOHN BUCKNILL. 1817--1897.

John Charles Bucknill was born at Market Bosworth in 1817, and died at Bournemouth in 1897. He was educated at Market Bosworth, Rugby, and University College, London, where he graduated with honours, 1840, first in Surgery, third in Medicine, Fellow in 1850, Council in 1884, benefactor at death; Lic. Soc. of Apothecaries, 1840; M.R.C.S., 1840; Lic. Royal College Physicians, 1853; Fellow, 1859; Council, 1877; Censor, 1879; Lumleian Lecturer, 1878; Fellow Royal Society, 1866; knighted, 1894. He commenced his career as House Surgeon, University College, London; thence he entered upon a small practice near Eaton Square, wherefrom the London fogs banished him to the Superintendency of the Devon Co. Lunatic Asylum. Here he worked with good effect and made his mark both as an experimentalist and a writer, which latter experience led him to start and edit the "Asylum Journal," now entitled the "Journal of Mental Science." He also wrote, conjointly with Dr. Hack Tuke, the "Manual of Psychological Medicine;" which held the field as a text-book for many years, and passed through several editions. Among other of his works may be noted his many critical essays on Shakespeare's psychological and medical knowledge, collected into two books; his works on habitual drunkards, and on criminal lunatics and their treatment. He carried on Conolly's great reforms whereby lunatics became emancipated from the fearful thralldom of former days.

He was a keen sportsman and was mainly instrumental in starting the Exeter and South Devon Volunteers, in 1852; the enrolment of which regiment Lord Palmerston subsequently specially mentioned in Parliament as the inception of the present Volunteer movement.

In 1862, he became one of the first trio of Visitors of Chancery Lunatics and so remained for 14 years.

T. C. A.

C. S. ROY. 1854—1897.

Charles Smart Roy was a native of Arbroath. He was educated in that town; then at St. Andrews, and then in the University of Edinburgh. At Edinburgh he graduated in medicine in 1875, and was subsequently appointed a resident physician at the Royal Infirmary in the wards of Dr. Balfour, well known as an authority on valvular lesions of the heart. On completion of the term of that office Roy moved to London, and there engaged in research work on the contagious pleuro-pneumonia of cattle. However, on the outbreak of the Turko-Servian war he volunteered for service. As Surgeon-Major in the Turkish Army he was given charge of the garrison hospital at Yanina in Epirus. Epirus remained untouched by the active fighting of the campaign, and during his garrison leisure Roy designed an instrument for recording changes in the volume of the frog's heart—his frog cardiometer.

At close of the war he returned to London, and finished his investigation into pleuro-pneumonia, conducting it at the Brown Institution. This work is the only one by him that deals mainly with anatomy. He proceeded next to Berlin. At Berlin he studied pathology in Virchow's Laboratory; but he also began, in Du Bois Reymond's Institute, an investigation into the physiology of the heart, chiefly with use of the cardiometer above alluded to. He was thus one of the earliest workers in Du Bois' new Physiological Institute, where Professor Kronecker was then chief assistant. He proceeded to his M.D. degree in 1878, and in that year his paper, "On the Influences which Modify the Work of the Heart," was published in Foster's *Journal of Physiology*—a paper based chiefly on the research done in Berlin.

In the course of the next year Roy went as assistant to the Physiological Institute of the Strassburg University, under Prof. Goltz. There he was allowed to devote his time almost wholly to research. Thence came "Observations on the Form of the Pulse-Wave as Studied in the Carotid of the Rabbit"—a paper showing more clearly than any of his previous the advent of an investigator of originality and great experimental skill. An instrument was devised for the research—the sphygmotonometer—a kind of plethysmograph, adapted to record the changing volume of the free but unopened blood-vessel. Original tracings obtained in this research hang now in not a few laboratories both at home and abroad. It was at Strassburg that Roy devised his instruments for measuring the extensibility and elasticity of the walls of blood-vessels. This latter subject was dealt with by him in a paper appearing in Foster's *Journal* in 1879. His instrument had points of

resemblance with the Holmgren-Blix myographion, but preceded it, and was invented altogether independently of it. In the same year was published, also in Foster's *Journal*, his work with Dr. Graham Brown of Edinburgh, on capillary blood pressure. The research furnished more trustworthy measurements than any pre-existing of the kind. They provided data, until then almost wanting, regarding one of the most important factors in the circulation. The method employed was extremely ingenious, and for its object has never been surpassed in accuracy.

Roy now moved from the Physiological to the Pathological Laboratory at Strassburg; both buildings were then close together in the old École de Médecine, near the Spital Thor. He, however, found v. Recklinghausen's laboratory occupied so exclusively in the anatomical aspect of disease that he soon migrated to Leipzig, attracted thither by the teaching of Cohnheim. There, in personal contact with Cohnheim, his attention was directed to problems regarding the renal circulation. He invented the instrument by which his name is best known—the renal oncometer—for the study of variations of the blood-flow through the kidney. The instrument is now familiar to every physiologist and pathologist. With it Roy and Cohnheim prosecuted a research which remains a classic to students of the circulation. The acquaintance of the two workers rapidly ripened into close friendship. The late Prof. Kühne, in his memorial sketch of Cohnheim (1885) prefixed to the *Gesammelte Abhandlungen*, wrote: "These exact and laborious researches, through which the younger worker and the elder will go down to posterity together, were the last that Cohnheim himself ever entered upon. During their prosecution it was a delight to him to admire the wonderful skill and easy dexterity of his younger colleague; he saw that those gifts were well suited to advance scientific pathology in the very direction in which he himself believed it could prosper best." Cohnheim's death in 1884, at the early age of forty-five, was felt by Roy as a severe personal loss. He often spoke of Cohnheim in terms of enthusiastic admiration. He looked upon himself as in a way representing in this country the leadership which Cohnheim held in the new school of pathology in Germany. Roy stayed at Leipzig nearly a year. While there he received the "George Henry Lewes Studentship" for research in physiology, founded by "George Eliot." He was its first recipient.

In tenure of this studentship he worked in Prof. Michael Foster's laboratory at Cambridge. Thence he issued his paper, "On the Physiology and Pathology of the Spleen." This communication contains his discovery of an autocthonous rhythmic tonicity in the mammalian spleen; the vasometer reactions of the organ were also elucidated. In 1882 Roy was appointed Professor Superintendent

of the Brown Institution. There he plunged into the work on the actions of the mammalian heart work, which he never relinquished until nervous breakdown divorced him from all laboratory cases.

In the year 1884 Roy was elected to the Fellowship of the Society, and very shortly afterwards he was appointed to the newly-established Chair of Pathology in the University of Cambridge. He was then in his thirtieth year. Although his activity at Cambridge during his later tenure of the chair suffered under his failure in health, and in the early period was hampered by want of accommodation in the matter of laboratory room and equipment, Roy's work for pathology in the University, for the short time that it had free scope, was marked by conspicuous success in many ways. In 1887 he succeeded in securing the foundation for pathology of the J. Lucas Walker Studentships. The selection of these students lay largely with him, and in his laboratory the main part or the whole of their work was accomplished. The recital of their names—J. G. Adami, W. Hunter, Alfred Kanthack, Lorrain Smith, W. Wesbrook, Louis Cobbett—suffices to indicate the sterling value of Roy's judgment and discretion in this part of his office.

In 1889 buildings vacated by the Chemistry School were transformed and refitted to receive the department of Pathology. From the better laboratory proceeded a rapid output of excellent work in experimental pathology; researches on endocardial pressures, on the relation between heart beat and pulse wave, on the mechanism of the circulation in the brain, on the specific gravity of the blood, on the causation of "shock," on mechanisms protective against infection, on the seat of the formation of hæmoglobin, on phagocytosis; in all these he was, if not the initiative spirit, a participant and adviser, evincing always the keenest and most sympathetic interest. His interest in biology was strikingly catholic, but problems dealing with the circulation had paramount attraction for him. Encouragement to devote attention to the clinical aspect of that field was given him by his colleague, Clifford Allbutt, the Regius Professor of Physic. In 1892 appeared, in the "*Philosophical Transactions*," the long work on the mammalian heart carried out with Professor Adami. Instruments were to a large extent specially devised for this research. The cardiac plethysmograph and the cardio-myograph were each examples of ingenuity that never failed to meet with resource the mechanical difficulties of a subject numerously beset by them.

Roy entered upon pathology at a time when advance in bacteriological methods was opening to it new fields for investigation in regard to the diseases of infection and their remedy. He welcomed this new line of enquiry with characteristic readiness, and at once felt its coming value. But the somewhat monotonous kind of labour involved in this class of investigation was tedious to him to a degree:

unexperienced by less rapid and less impulsive workers. He, however, contributed to such investigations. When Professor Superintendent of the Brown Institution he was commissioned to investigate in the Argentine Republic a disease which was devastating the herds in the province of Entre Rios. He succeeded in devising a preventive inoculation which alleviated the mischief. In 1885, Asiatic cholera having appeared in a very severe epidemic form in Spain, he, with Graham-Brown and Sherrington, investigated the bacteriology of the epidemic throughout the summer and autumn of that year. The work was one of the earlier confirmations of Professor Koch's discovery of the cholera-spirillum as the concomitant of the disease. In evidence of his sterling enthusiasm for this branch of his science, it may be recalled that Roy was one of the earliest, perhaps the earliest, to start and urge forward the movement which has resulted in the foundation of the "Jenner Institute."

His death at the early age of forty-three came somewhat suddenly, though after complete nervous breakdown had for three years removed him from scientific work. In 1887 he married Violet, daughter of Sir George Paget, the late Regius Professor of Physic at Cambridge.

A man of strong convictions, almost impetuous in his determination to act upon them, Roy as a pathologist had the firm belief that the future of pathology lay along the same lines of advance as physiology has followed with success. The inferences to be drawn from mere anatomical study of structural changes induced by disease he considered to have been for the time being practically exhausted. Indeed he thought much toil had been wasted in pushing such observation into confines of hair-splitting minuteness. Not that he took little interest in microscopy. New methods of staining tissues, of colouring bacteria, and of following the appearances of cell-life appealed to him strongly, and he was early to follow them. It was rather that the laborious unravelling of an individual autopsy by prolonged anatomical search and argument seemed to him unfruitful, and he gave little time to it. He looked for inspiration to physical and chemical and physiological methods. He declared the relative paucity of the British contribution to pathological discovery in his own and the preceding generation due to allotment of an excessive time in the medical schools to mere dissecting-room work. He maintained that this rather closed than opened the mind for the broad problems of medicine, and that in addition it left the student unequipped for scientific lines of research. His own ingenuity in devising and his skill in using mechanical apparatus might be termed, as Kühne expressed it, quite "extraordinary." It was to a certain extent harmful to the quality of his work: it limited the scope with which he undertook and the depth to which he pursued a subject; it

continually tempted him to wander from investigations towards which he had already accomplished the preliminaries to open fresh ground in some other direction. A plan usual with him in his own work was to set before himself some particular measurement, *e.g.*, the change in volume of an organ under certain conditions; the more difficult the experiment the more attraction it had for him; he devised appropriate apparatus, tried it, altered it, made it successful, obtained a limited number of complete observations, and then moved to another problem often not cognate with that previously taken up. As an operator in the laboratory he had no equal in this country. His scientific papers were all written in a brief, simple, and direct style, without repetition of statement, almost always with exclusion of all protocols of experiments, and usually without even any final recapitulation.

As a teacher his career commenced and ended at Cambridge. His lectures, especially those on the circulation, were effective mainly by their striking originality. In the students who attended his classes for ordinary examination purposes he took curiously little interest, whether they passed or failed, attended or did not attend, seemed to go quite unnoted by him. To those who came to pursue research, even of the most unambitious kind, he was a different man. To these he gave time and thought unstintingly. He treated them almost forthwith as personal friends, and he attached them to him by many ties of kindness and respect. In regard to their work he was always interested, always sympathetic, equally so in failure and success, and always ready to throw all his knowledge and resource, and on many occasions hours upon hours of work, into overcoming the difficulties their experiments encountered.

Professor Roy was of middle height, strongly built, and naturally very resistant to fatigue. He was of ruddy complexion. He became quite prematurely grey. A feature of his character was physical courage amounting to enjoyment of personal danger. Among his pastimes were boating and riding. The flight of birds, the possibility of aerial flight by man, and the construction of flying machines formed a favourite theme of conversation with him; and he had made some experiments upon the subject.

C. S. S.

SIR JAMES PAGET, BART. 1814—1900.

The career of Sir James Paget, which was closed by his death in January, 1900, had been one of the utmost advantage to medicine. Not only had he by innumerable observations on disease enriched with new and valuable possessions the special department of clinical surgery, but by his unwearied devotion to science in general, and to

the cause of education, he had earned the gratitude not alone of all classes of the profession to which he belonged, but of the nation into which his lot was cast. He died full of years and of honours. Although he had for some time been more or less disabled by illness he had continued his labours for the public good up to the last sitting of the Royal Commission on Vaccination. He signed the Report of this Commission, and it was probably the last of the more important acts of his life. A form of aggressive muscular paralysis was at that time threatening him, and its steady progress not long afterwards deprived him of the use of his limbs. His intellect was unclouded to the last; nor, excepting that it incapacitated him from most of the enjoyments of life, was his illness attended by pain. He was within a few days of his 86th year when he passed peacefully away, free, as one of his sons has written, "from even the least pain or trouble of mind or body."

Sir James was of Norfolk family and was born at Great Yarmouth, in 1814, being one of a large family. His only education was that of a school in his native town, but as such it was good, and it was supplemented by the influence of highly intelligent parents. Having served an apprenticeship of nearly five years, under favourable conditions, in the same town, at the age of 21 he came to London, and was entered as a pupil at St. Bartholomew's Hospital. Before leaving Yarmouth he had taught himself French, and had read largely both in medicine and natural history. He was a trained botanist, and in conjunction with a brother had already published a *Natural History of Great Yarmouth*, devoted, we believe, chiefly to its flora. His elder brother, George, afterwards Sir George, had been at St. Bartholomew's before him. During his first year he was fortunate enough to discover in the dissecting-room subject the *Trichina spiralis*, concerning which he wrote a very complete account. He obtained his diploma at the College of Surgeons in 1836, having previously distinguished himself as a prize winner in the Hospital Classes. Then followed several years of laborious work in London, during which Paget supported himself by medico-literary work, by coaching students, and by a very small stipend as Curator of the Museum of St. Bartholomew's. In 1839 he narrowly escaped death from typhus fever. Soon after this his career as a teacher began by his appointment as Demonstrator of Morbid Anatomy, and in 1843 he was appointed Warden of the newly established College for resident students at his hospital. This office enabled him to crown a long engagement by marriage to one who proved a most devoted helpmate almost to the conclusion of their long united life. Lady Paget predeceased her husband by only a few years.

Paget's demonstrations were from the first exceedingly popular with

the hospital students and he early secured the good opinion of some of the senior members of the staff, more especially of Mr. Lawrence and Mr. Stanley. The latter was his enthusiastic admirer and friend. With him, in 1842, Paget undertook the preparation of a catalogue of the specimens in the Museum of the Royal College of Surgeons. This was a work involving enormous labour, and it was completed in a way which constituted the resulting volumes a model for all similar undertakings. It was not till 1847, when he was 33 years old, that Paget secured his first step on the surgical staff of St. Bartholomew's. Four years later he resigned his Wardenship on account of the increasing claims of private practice, and from this time onward his success was rapid. He resigned the appointment of full Surgeon to St. Bartholomew's in 1871, having held it ten years. As early as 1858 he had been appointed Surgeon-Extraordinary to the Queen, and in 1871 he was made a baronet. In 1874 he became President of the College of Surgeons, having been for long a member of its Council, although he had never accepted the office of Examiner. In 1876 he was elected representative of the College on the General Medical Council, being at the time President of the Royal Medical and Chirurgical Society. At the age of 73 such was his youthful energy and zeal that he did not consider himself too old to accept the post of President of the Pathological Society.

It would be tedious to attempt to enumerate in further detail the honourable appointments which from year to year he undertook, or the honours which were conferred upon him. He was a member in succession of several Royal Commissions, and Vice-Chancellor of the London University.

Our estimate of the influence which Paget exercised on the destinies of his profession must not be restricted to any work which bears his name. In countless committees, not a few councils, and several important commissions his was a guiding voice; innumerable were the resolutions, recommendations, and reports which he originated. His calm, clear judgment was always recognised; and whatever he said was sure to be received with the utmost attention by all, and by the majority with acquiescence. Seldom, indeed, was his vote given in the minority, but more often than not it was his speech which had decided the conclusion. The writer sat with him many years in the Council of the Royal College of Surgeons, in the meetings of the Committee on Leprosy originated by the Prince of Wales, and through two long Royal Commissions, and had abundant opportunities for appreciating his almost unerring skill in the mastery of facts and his unequalled facility in expressing the opinions at which he had arrived.

There is yet another department of silent influence which should

be mentioned. Few men had exercised a wider power than he in the nomination of younger men to posts of importance. He was consulted by public bodies on all hands, his appreciation of character was excellent, and his suggestions were always judicious. Not a few of those who in various places now hold high positions in the profession were in their early career his nominees.

As a practical surgeon the qualities which Paget brought to his patients' help were cool nerves, keen observation, clear judgment, and wide experience. At the hospital his diagnosis was highly valued by all his colleagues. At a later period in his career, during the quarter of a century of his most active practice, his verdicts were regarded as well-nigh conclusive by the whole British profession.

As an operator he was at no time showy, but at all times safe. He always did what he had set himself to do with unflinching regard to his patients' interests.

Perhaps it might be said that sobriety of mind was the distinguishing feature in Paget's character. He was never excited and never below par, but always in full possession of the same clear intelligence and capacity for open-eyed observation. Never for a moment did his wits fail him, either as regards what ought to be said or the best words in which to say it. His handwriting might perhaps be quoted in illustration of his unfailing balance. It was always, whether written in haste or at leisure and regardless of varying qualities in pen and paper, exactly the same. Readiness of reply and aptness at repartee may probably be taken as good evidence of this most enviable presence of mind. Many good things might be related of Paget in this direction.

It is perhaps in some place between John Hunter and Sir Benjamin Brodie that we should find a niche for Paget. His enthusiasm for Hunter and his methods of thought and work was unbounded; and although not a great collector himself, it was because the need for that kind of work had to some extent passed, rather than from want of zeal. His industry as a museum expounder was proved by the production of his *opus magnum*, the Catalogue of the Pathological Part of the Hunterian Collection. Until his time was absorbed by private practice and public committees he was indefatigable in microscopic research. Yet in his relations to the profession and the public, as, having been for a long series of years the acknowledged head of the surgical calling in Great Britain and Ireland, he more nearly trod in the steps of Brodie than of Hunter, and between these two a very interesting parallel might be drawn.

As some proof of his success as an observer it may be noted that no fewer than three different maladies have become known by his name.

Leaving aside the *Trichina spiralis*, we have Paget's Osteitis deformans and Paget's nipple cancer.

It would be unpardonable in any sketch of Sir James Paget's character and attainments not to make special mention of his skill as an orator. At the same time it must be insisted that his success in this direction was in the main due to the fact that he had always something to say which was worth saying, and that he always knew exactly what it was that he wished to say. It was no mere skill in the arrangement of words which gave a charm to all that he uttered in public. The manner was, it is true, something, but the matter was far more. His renown as an after-dinner speaker was probably second to that of no one during the years of his prime. Nor were his more formal public addresses less successful. The latter were, it is believed, always very carefully prepared, but many were the occasions on which an impromptu speech gave proof that such preparation was by no means essential. His sentences were always remarkable for their clearness, and they were never laboured or ornate. He paid no fulsome compliments, he told no anecdotes, he never indulged in quotations. His language was always his own, and it was its singular appropriateness to the subject, together with an inimitable air of spontaneity and ease, which made it so pleasant to listen to. His fame as a speaker began with his earliest lectures to the students of St. Bartholomew's, and it continued to gather force through the whole of his life. The same qualities which distinguished his *viva-voce* efforts are observable also in his writing. His papers in the Medico-Chirurgical Society's Transactions are models of what such compositions should be, not alone in completeness of detail but in clearness of statement.

J. H.

PROFESSOR HENRY HENNESSY. 1826—1901.

Professor Henry Hennessy was the second son of John Hennessy, of Ballyhenessy, and was born March the 19th, 1826, at Cork. He received at school an excellent education in classics, modern languages, and mathematics. His profession was originally that of a civil engineer, but he devoted such time as he could spare from professional employment chiefly to mathematical investigations. His contributions to science number some eighty or more original papers contributed to the "Philosophical Transactions" and "Proceedings" of the Royal Society, to the 'Comptes Rendus,' and to the Royal Irish Academy. In 1845, in an article published in the "Philosophical Magazine," he proposed to apply photography to the

registration of the thermometer and barometer in meteorological observations, and was apparently the first to discern the importance of such records. In 1851 he contributed to the "Philosophical Transactions" his "Researches in Terrestrial Physics," dealing with the figure and primitive formation of the earth and planets. He maintained the view of the fluid origin of these forms, and showed that all the facts concerning the earth which come under our notice are best explained by the existence of fluid matter at a high temperature enclosed within its crust. He wrote on climate (British Association Reports, 1857), and claimed to have proved the existence of laws regulating the distribution of temperature in islands, and to have deduced consequences of general application from the physical properties of water. The gist of his arguments is contained in a paper in the "Proceedings," 1857-59, "On the Influence of the Gulf Stream on the Winters of the British Isles." This led, in 1870, to his being called upon to report on the temperature of waters surrounding the British Isles, for the information of a committee of enquiry into Irish Fisheries. He advocated a great extension of inland river and canal navigation. He also proposed a decimal system of weights and measures, based upon the length of the earth's polar axis, a quantity which is capable of more accurate determination than the earth's quadrant. Standards, such as the polar foot and the polar pound, with a complete series of weights and measures on the polar system, are contained in the Museum of the Royal College of Science, Dublin. There are also, in the same collection, many ingenious models and inventions designed by Professor Hennessy to illustrate various principles, chiefly in mechanism, but also in matters touching civil engineering, such as, for instance, the form and structure of sewers best adapted to the purpose of obtaining the greatest scour, with due provision for a great influx of storm water. ("Hydraulic Problems on the Cross-sections of Pipes and Channels." "Proc.," 1888.) There are also models illustrating the geometrical construction of the cell of the honey bee, which was the subject of three short communications published in the "Proceedings," 1885 to 1887.

In 1855, on the invitation of Cardinal Newman, he accepted the appointment of Professor of Physics in the Roman Catholic University of Ireland, and, in 1874, he became the Professor of Applied Mathematics in the Royal College of Science.

On several occasions he delivered admirable addresses and lectures on university education in its relation to the study of science as a branch of human knowledge, as well also in its applications to the Arts and Manufactures, or what is now generally known as Technical Education. On this subject his opinions were thoroughly sound, and worthy of much greater respect and attention than they actually

received at that time. To those who personally evinced an interest in his work he was always pleased to explain his views, and the use of his models. This he did with much lucidity and a remarkable modesty of manner. The writer cannot easily forget the feeling of admiration he experienced for his literary ability when, at a meeting, now many years ago, a long official letter was read, and during the progress of an ensuing discussion Professor Hennessy, on the instant, wrote in detail a complete and lengthy reply, which, without erasure or alteration of a single word, presented the views of himself and colleagues so clearly and cogently that it was at once adopted.

During the College Session of 1890–91 he was called on, under the then recently-made Treasury rules applicable to clerical and administrative officials in the Civil Service, to retire from the Chair of Applied Mathematics which he had filled with such distinction, and, as no intimation that such a course of action was intended had been communicated to them, a great surprise fell upon some of his colleagues when they became aware, during the Christmas vacation, from persons wholly unconnected with the College, not only that he had actually gone from among them, but that a successor had been appointed for the immediate discharge of professorial duties. Although reticent on the matter, there is no doubt he experienced a very grievous disappointment at having to withdraw his services after so many years of earnest devotion to the cause of public education, and that too under conditions of peculiar hardship to which no other class of members of the Civil Service are subjected. A memorial on his behalf, signed by the President and a large number of Fellows of the Royal Society, and Professors in the principal Universities of the United Kingdom, was presented to the Government, but without effect. He had to spend the remainder of his days in retirement on a small pension entirely inadequate in amount, especially considering the services he had rendered. He resided abroad for some time, but, under medical advice, returned to Ireland, and died at Bray, co. Wicklow, on the 8th of March last. It is much to be regretted that his widow is but slenderly provided for out of the savings put by from the small income attached to his professorship. In the estimation of his colleagues his personal character was that of an amiable, courteous, and high-minded gentleman.

W. N. H.

CHARLES HERMITE. 1822—1901.

Charles Hermite, the distinguished French mathematician, was born at Dieuze, in Lorraine, on December 24, 1822. His education was begun at Nancy, and was continued at Paris, where the marked

mathematical powers of the youth greatly impressed the professor* in the Collège Louis-le-Grand.

Hermite's first memoir belongs to 1842, the greater part of that year being spent in preparing for entrance into the École Polytechnique. Some idea of his attainments and his ability may be gathered from the fact that, immediately after entering, and on the advice of Liouville, he wrote (in January, 1843) to Jacobi submitting some theorems which he had obtained relating to hyper-elliptic functions; and in the succeeding year, he similarly submitted some results in elliptic functions. This work was deemed of high value by the older mathematician, who caused the letters to be printed in 'Crelle's Journal,'† together with an encouraging reply of his own, concluding with the words: "Ne soyez pas fâché, monsieur, si quelques-unes de vos découvertes se sont rencontrées avec mes anciennes recherches. Comme vous dûtes commencer par où je finis, il y a nécessairement une petite sphère de contact. Dans la suite, si vous m'honorez de vos communications, je n'aurai qu'à apprendre."

The talent that Hermite showed during his course at the École Polytechnique indicated mathematics as his obvious career. He passed through the usual initial stages until, in 1862, he was appointed to a post specially created for him on the initiative of Pasteur. This post he held until 1869, when he succeeded Duhamel as professor of higher algebra at the Sorbonne, and as professor of analysis at the École Polytechnique. The latter chair he occupied only until 1876; he continued the former until 1897, when he retired from active teaching. His life appears to have passed in a quiet round, devoid of events of general external interest; but its influence was indicated by the character of the formal celebration of his seventieth birthday, when he was presented by pupils and a host of friends and admirers from all countries with a medal struck for the occasion.

Hermite had been elected a member of the Académie des Sciences in 1856, in succession to Binet. He became a Foreign Member of our Society in 1873: at the time of his death, there was only one Foreign Member senior to him. He was made an honorary member or a foreign associate of many (perhaps of most) of the learned societies of the world. In recognition of his discoveries, he had received a number of decorations from various countries: thus he was numbered among the knights of the Prussian "Ordre pour le Mérite."

He died in Paris on the 14th of January, 1901. The words of Jordan, Darboux, Appell, Painlevé, and others, were an indication, not

* M. Richard, who had had Galois for one of his pupils fifteen years earlier.

† Vol. 22. See also Jacobi's 'Ges. Werke,' vol. 2, pp. 87–120.

merely of the loss to science, but also of the sense of personal loss to friends which was caused by his death.*

He wrote nearly 200 papers, which have been published in a great variety of places.† Many of these papers appear in the guise of letters to mathematical friends, a form of communication which he practised through his whole life.

In addition, his lectures at the École Polytechnique were published (in book form) in 1873: his lectures at the Sorbonne were published (in lithographed form) first in 1882, and they have now reached the fourth edition. Also he appended, to the 1894 edition of Serret's 'Differential and Integral Calculus,' a "Note on the Theory of Elliptic Functions," which in the course of 160 pages gives an admirable outline of that theory.

As is shown by the list of his papers, Hermite wrote on many topics within the range of analysis: the subjects which recur most frequently are the theory of numbers, invariants and covariants, definite integrals, theory of functions, theory of equations, and elliptic functions. If special mention may be made of advances that are due to him, and of substantial discoveries achieved by him, instances can be selected from each of those subjects.

Thus, in the theory of numbers, he connected the use of continuous variables with quadratic forms: and he introduced conjugate indeterminates into the discussion of those forms. Perhaps the most wonderful of all his researches in this region was his proof (1873) of the transcendence of e , the base of the exponential function—a proof which, duly modified, led Lindemann to the establishment of the transcendence of π , and so showed the quadrature of a circle to be impossible.

In the theory of invariants and covariants, where he was a fellow-worker with Cayley and Sylvester, Hermite had an important share. He was responsible for the law of reciprocity whereby, to every covariant of degree n in the coefficients of a quantic of order m , there corresponds a covariant of degree m in the coefficients of a quantic of order n . He discovered the skew invariant of the quintic, which was the first example of any skew invariant. He discovered the linear covariants belonging to quantics of odd order greater than 3, and he

* The writer of this notice wishes to acknowledge his indebtedness to an article by M. Émile Picard, "*L'Œuvre scientifique de Charles Hermite*," *Ann. de l'Éc. Normale*, 3^e sér., vol. 18 (1901), pp. 9—34. There is also a brief notice by M. Jordan in '*Liouville's Journal*,' 5^e sér., vol. 7 (1901), pp. 91—95; and a sketch, together with a bibliography of Hermite's writings, is given by M. P. Mansion in the '*Revue des Questions Scientifiques*,' 2^e sér., vol. 19 (1901), pp. 353—396.

† It is understood that his works will be published in a collected edition by Gauthier-Villars, to be edited by Picard, who is Hermite's son-in law.

applied them to obtain the typical expression of the quantic in which the coefficients are invariants. He also invented the associated co-variants of a quantic; these constitute the simplest set of algebraically complete systems as distinguished from systems that are linearly complete.

In the theory of functions, it is almost difficult to select representative instances from among his many contributions to that subject, in which he may be regarded as the foremost of French writers since Cauchy. Not the least important are the special advances he made in the transformation of the double theta-functions and the associated Abelian functions: his memoir has been the suggestive starting-point for many other investigations. Anyone acquainted with the progress of the subject in the last 30 or 40 years will recognise that Hermite has given an entirely new significance to the use of definite integrals in the theory of functions: it is enough merely to mention the developments of the properties of the gamma-function which have been thus initiated. Indeed, he seems to have been the one mathematician of the later half of the nineteenth century who could work easily with definite integrals, almost recalling the fruitful activity of Euler in the same medium, but with an accuracy and a precision that were impossible in Euler's day.

The theory of elliptic functions, on the Jacobian rather than on the Weierstrassian basis, is selected by Picard as having been Hermite's favourite study; and the selection appears justified by the number of his papers on the subject. To him is due the reduction of an elliptic integral to its canonical form by means of the syzygy among the concomitants of a binary quartic. His investigations on modular functions and modular equations are of the highest importance. It was Hermite who discovered pseudo-periodic functions of the second kind, and developed their properties. In a memoir that may fairly be described as classical,* he applied these functions to the integration of the unspecialised form of Lamé's differential equation; and elliptic functions generally were applied in that memoir to obtain the solution of a number of physical problems.

In the theory of equations, there are two significant contributions which will be specially associated with his name. One of these is the form which he gave to Tschirnhausen's transformation, with its accompanying property of securing invariance for the transformed equation; he also applied it to obtain invariantive criteria for the reality of the roots of a quintic equation. The other of the contributions indicated

* "Sur quelques applications des fonctions elliptiques"; it appeared in the 'Comptes Rendus,' vol. 85 (1877), vol. 86 (1878), vol. 89 (1879), vol. 90 (1880), vol. 93 (1881), vol. 94 (1882); and the various parts were afterwards gathered into a quarto volume of 146 pages (Paris, Gauthier-Villars, 1885).

is the actual solution of the quintic equation by means of modular functions; in this result of supreme importance he was followed by Kronecker and Brioschi.

One quality of his papers deserves notice: it is the singular clearness with which they are written. It is a commonplace to refer to style as a characteristic of French writers; but mathematical investigations do not always lend themselves to clear and finished exposition. Hermite's papers are remarkable for this quality.

This brief sketch may be sufficient to give a slight indication of the range of activity of Hermite's genius. His interest in mathematics remained undiminished to the last. For many years he had been regarded as the venerated chief among French mathematicians, sustaining the great traditions of the past and sympathetic with the rising workers of his later days.

A. R. F.

HENRI DE LACAZE-DUTHIERS. 1821-1901.

By the death of Henri de Lacaze-Duthiers, Member of the Institute of France, Zoology has lost a worker whose influence on the study of marine Invertebrates it would be hard to overestimate. Not only was Lacaze-Duthiers an able investigator, but he was conspicuous for his success as the head of an important school where many distinguished zoologists have received their training, as the founder and editor of the "*Archives de Zoologie Expérimentale et Générale*," and by no means least as the originator of the Marine Zoological Laboratories at Roscoff, in Brittany, and Banyuls-sur-Mer, on the Mediterranean coast of France.

The key-note of Lacaze-Duthiers' work is struck in the introduction to the first volume (1872) of his journal. "*Etre expérimentale: tel est le caractère que doit avoir désormais la Zoologie.*" By "*expérimentale*" is understood something widely different from investigations into "*Entwickelungsmechanik*," or from those which concern the breeding of new races. Thus, in discussing the affinities of *Laura gerardiae* (1882), he feels the need of further information with regard to the metamorphosis of *Sacculina*, and points out that, by accurately ascertaining the conditions under which this animal lives, it may be possible to keep its young stages alive in order to study their development. "*Il faut en un mot faire de la zoologie expérimentale.*" "*Experimental zoology*" is, in fact, the use of morphological methods of research, combined with the study of bionomics.

Lacaze-Duthiers excelled in the art of making minute dissections. In one of his latest works (1900), he deplores the fact that

"on ne dissèque plus." The method of serial section-cutting is said to be responsible for this result, and though indispensable in certain cases, it replaces too often study by actual dissection. The view here indicated dominates the whole of Lacaze-Duthiers' work, which, in spite of his practical refusal to avail himself of modern methods, contains many results of great importance.

Where so much is good it is difficult to select the best, but Lacaze-Duthiers is probably most widely known for his researches on the morphology of Mollusca and Coelenterata. His earlier memoirs were published in the "*Annales des Sciences Naturelles*," a journal which he forsook for his own "*Archives*," from the commencement of the latter in 1872. His first work of any importance appears to have been the series of papers on the genital armature of Insects, published in the "*Annales*," from 1849 to 1853, and immediately followed by a treatise on Galls, which appeared in the botanical section of the same journal. For some years after 1853, his principal interest was in the Mollusca. In 1854 and 1855 he was engaged in the study of Lamellibranchs; the memoir on *Anomia* demonstrating the fact that this somewhat aberrant form does not differ essentially from other Lamellibranchs, and is in no sense transitional to the Brachiopods; those on the generative organs and the organs of Bojanus in the same group also contributing largely to the advancement of the knowledge of this division of the Mollusca. In 1856 and 1857 appeared one of his best-known works, the classical account of the anatomy and development of *Dentalium*. Some of the figures published in the memoir on *Bonellia* (1858), have re-appeared in almost every zoological text-book, while the papers on *Pleurobranchus* and *Haliotis* (1859) are hardly less well known. During a visit to Minorca, in 1858, he noticed an "ignorant fisherman" marking his clothes with the "purple of the ancients." This event led to the publication of the scholarly "*Mémoire sur la Pourpre*" (1859), in which, by the citation of classical authorities and in other ways, he established the fact that the purple was probably that which is produced in certain species of *Murex* and *Purpura*, by what is now known as the hypobranchial gland; and showed that the secretion of the gland acquires its final colour by exposure to the sunlight. A summary of this work appeared in vol. x. of the "*Proceedings*" of this Society. Lacaze-Duthiers returned to the same subject in 1896, in introducing to the readers of the "*Archives*" an archæological memoir on the purple by M. Dedekind.

The French occupation of Algeria was responsible for the appearance, in 1864, of one of Lacaze-Duthiers' most celebrated works, the "*Histoire Naturelle du Corail*." A special administration having been created for the affairs of Algeria, M. le Comte de Chasseloup-Laubat, the head of the administration, bethought himself of the

interest which he had taken, in 1834, in the fishery of Red Coral in that locality, and decided that a scientific enquiry should be made on the subject. The work was offered to De Quatrefages whose occupations did not permit him to undertake the task, and he accordingly wrote, in 1860, to Lacaze-Duthiers, inviting him to study the question. Lacaze-Duthiers accepted the offer, and at once went to Algeria, charged with an official mission to study the natural history of *Corallium*. The work occupied him for two years, and the memoir which was its result, illustrated by beautiful figures drawn by the author, immediately took a leading place in the literature of the Alcyonaria. An admirable account is given of the structure of *Corallium*, including that of its skeleton, of the reproductive phenomena, and of the metamorphosis of the larva, while the practical aspects of the question are treated with the author's characteristic thoroughness. An interesting history is given of the discovery by Peyssonnel of the animal nature of *Corallium*, and of the incredulity with which Peyssonnel's results were received by Réaumur and Bernard de Jussieu.

The work on the Red Coral was succeeded by the memoirs on *Gerardia* (1864), and other Antipatharia (1865). These papers added not a little to the proper understanding of this group of Zoantharia, and, in particular, they gave much needed information as to the characters of the living polypes of the "Black Corals."

Continuing his researches into the structure and development of Actinozoa, Lacaze-Duthiers published, in 1872, his classical memoir on the development of the Actiniaria. The account there given of the order of the appearance of the mesenteries forms the basis of our modern knowledge of this subject, and is well known to every student of Sea Anemones. This memoir appears in the first volume of the "Archives de Zoologie Expérimentale et Générale," of which the first number was ready for distribution in 1870, although the outbreak of the Franco-Prussian War, in that year, delayed its appearance until 1872. Lacaze-Duthiers' activity at this period is strikingly shown by his own contributions to the first volume of the "Archives." Besides the work on Actinians, the volume contains a study by him of the otocysts of Molluscs, another on the structure of aquatic Pulmonate Gasteropods, besides notes on the occurrence of the stalked larva of *Antedon* at Roscoff, and on the remarkable Chætopods, *Chætopterus* and *Myzicola*, observed at the same place. The treatise on the otocysts was summed up in the generalisation that the "auditory" nerves of Mollusca always originate from the supra-œsophageal ganglia, in the neighbourhood of the optic nerves. The supra-œsophageal ganglia are thus the centre which supplies the principal sense-organs; while the pedal ganglia, with which the nerves of the otocysts are often apparently connected, are purely

motor in function. There are perhaps few anatomical figures of Invertebrates which have more frequently been copied than that of *Cyclostoma, elegans*, which is published in this paper. The memoir on aquatic Pulmonates, besides giving an elaborate account of many other structural details, contains a description of a sense-organ which has often been referred to as "Lacaze's organ," and was later identified by Spengel with the "olfactory organ" of other Molluscs, a structure now usually known by Lankester's term "osphradium."

In the succeeding volume of the "Archives" (1873), Lacaze-Duthiers reverts to the Actinozoa in a paper dealing with the anatomy and development of *Astroides calycularis*. Here again he had the good fortune to break fresh ground, and his paper was not only the first to give a satisfactory description of the development of one of the Zoantharian Corals, but the account therein contained of the development of the theca and septa is indispensable to all students of this group.

In 1882, Lacaze-Duthiers published his account of *Laura gerardiae*, a remarkable type of parasitic Crustacea. This had involved a new visit to Algeria, undertaken with the object of further elucidating the structure of certain organisms which had aroused his interest during the first visit; and among these objects *Laura*, of which a preliminary description had been published in 1866, occupied a foremost place. The difficulties to be overcome were not slight; and among them the principal one was to obtain a supply of the *Gerardia* which forms the host of the parasite. The occurrence of unbroken colonies of this large and fragile Antipatharian in any locality shows that that spot has not been disturbed by the Coral-dredgers; and any fisherman who finds an uninjured colony of *Gerardia* is careful to conceal the fact that he has discovered a bank which may harbour the precious Red Coral.

The investigation of this subject showed that *Laura* belonged to an entirely new group of the Cirripedia, for which the name Ascothoracida was proposed. The structural details described are of great interest, and not least of all in offering a fresh illustration of the tendency shown by the Cirripedia to exchange their normal life as animals fixed to some inanimate body for a condition of parasitism. The adaptations to a parasitic existence shown by *Laura* differ in a striking way from those which have been evolved in other Cirripedes which have independently acquired the same habit of life. Although one or two other genera of Ascothoracida have more recently been discovered (to one of which the name *Petrarca* has fitly been given), Lacaze-Duthiers' account of the type-genus is still by far the most complete that has appeared of any member of that sub-order.

It has only been possible to touch on a few of Lacaze-Duthiers' contributions to Invertebrate morphology. Besides the smaller communications contained in the "Comptes rendus," from 1853 onwards, there are the well-known larger memoirs on *Vermetus* (1860), Brachiopods (1861), Ascidians (1874, 1877), *Aspergillum* (1883), *Testacella* (1887), and others.

His activity showed but little sign of slackening even towards the close of his life. He published voluminous papers on Actinozoa in 1895, 1897 and 1900; while during the last decade there appeared a beautifully illustrated account of the Cynthiidae of Roscoff, written by him in collaboration with his former pupil, Professor Yves Delage.

In the midst of his own researches, Lacaze-Duthiers found time for establishing and carrying on the marine stations at Roscoff and Banyuls. The former was founded in 1872 and was later constituted an annexe to the Laboratories of the Sorbonne. The "Laboratoire Arago," at Banyuls-sur-Mer, was established in 1881 with the aid of a public-spirited contribution offered by the Municipal Council of that town. These laboratories have had the double object of bringing students of Zoology into contact with living marine animals during the first years of their study of Biology, and of encouraging original research. For the latter object they have been thrown open to Zoologists from all parts of the world with a hospitality to which the writer of these lines can testify from two separate visits to Roscoff. It is unnecessary to comment on the results of the enlightened policy which has given these admirable institutions a world-wide reputation.

Lacaze-Duthiers' efforts were not unrecognized in his own and other countries. He was Professor successively, and for about half a century, at the Faculté des Sciences of Lille, at the École Normale, and at the Museum and Faculté des Sciences of Paris. In 1887 his portrait was subscribed for by many of his pupils and other friends, as a token of the esteem in which his work was held. In 1897 he became a Foreign Member of the Royal Society. In 1900 the Faculté des Sciences of the University of Barcelona presented him with his bust, in recognition of his services in founding the Laboratory at Banyuls, and of the hospitality there shown to naturalists on the other side of the Spanish frontier. With this movement was associated a Committee including the names of many of the most distinguished Zoologists all over the world, and the presentation was made with impressive ceremony at the Sorbonne. The diploma of "Membre protecteur de la Société espagnole d'Histoire naturelle," a distinction previously granted only to four members of ruling houses, was bestowed on him at the same time.

The presentation at the Sorbonne proved to be one of the closing events of his life. Lacaze-Duthiers died at Las Fous in Périgord, on July 21, 1901, in his 80th year.

S. F. H.

CHARLES MELDRUM. 1821—1901.

Charles Meldrum was born at Kirkmichael, Banffshire, in 1821, and was educated at the University of Aberdeen, where he proceeded to the degree of M.A. In 1846 he was appointed to the Education Department of the Bombay Presidency, where he remained only two years. He was transferred to the Mauritius, as Professor of Mathematics at the Royal College.

Meteorological observations had, at that time, been carried on in the island for considerably more than a century, but in a spasmodic way; but in 1851, by the united efforts of Mr. C. J. Bayley, Lieut.-Col. Robe, C.B., Lieut. Fyers, Mr. Meldrum, and others, the Mauritius Meteorological Society was founded on August 1, for the express purpose, *inter alia*, of establishing a permanent magnetical and meteorological observatory in the island, and Mr. Meldrum was appointed one of its secretaries.

The main meteorological work carried on was the examination of the logs of all ships visiting the port, so as to collect information tending to the further development of the Law of Storms.

In the year 1859, meteorological instruments were installed in the old Government Observatory, and, in March, 1862, Mr. Meldrum was appointed Government Observer. Very soon after came on a critical period in the history of the nascent institution. Port Louis, where it was situated, is encircled by hills, and the want of a station in a more suitable locality was seriously felt. This idea had been broached by Dr. Thom even in 1853. In April, 1860, it was recommended that the observatory be sold, and that a new observatory be erected out of the proceeds. This sale was not carried out until the arrival of Sir H. Barkly, as Governor, in 1863. The site fetched £5,200, but several years elapsed before the new building came into existence. In 1866, Mr. Meldrum was sent to England to procure plant for the observatory and the necessary instruments for its outfit. In all these negotiations the late Sir E. Sabine, at that time President of the Society, took a most active part. Mr. Meldrum returned to the colony in 1863, and on Monday, May 30, 1870, the first stone of the new observatory was laid by H.R.H. The Duke of Edinburgh. It was not, however, until the beginning of 1875 that the full outfit of self-recording apparatus

for meteorology and terrestrial magnetism came into actual operation.

The observatory was designated as the Royal Alfred Observatory. Its site, at Pample Mousses, seven miles N.N.E. from Port Louis, is not a happy one, as the ground around is marshy and fever-stricken.

Mr. Meldrum's chief work, at first, was the extraction of meteorological observations from the log of every ship touching at Mauritius, and from this source he amassed a store of facts which he knew well how to utilize. Part of this was employed in the preparation of the cyclone tracks for the South Indian Ocean, a work subsequently published by the Meteorological Council.

Mr. Meldrum will chiefly be known by the persistent energy with which he studied the connection between the sun-spot period and the recurrence of the cyclones which too frequently devastate the waters round the shores of Mauritius. He early established a system of warnings for the cyclones approaching the island, and these were speedily found to be of value and were implicitly trusted in the port.

Mr. Meldrum received the degree of LL.D. from his own university. He was elected into this Society in 1876, and received the honour of C.M.G. in 1886. He was for ten years a Member of the Government Council of the island. In 1896 he returned to England in very failing health, and after four years of suffering he was at last released in August of this year (1901).

R. H. S.

GEORGE FRANCIS FITZGERALD. 1851-1901.

A thorough attempt to estimate the scientific value of FitzGerald's life and work cannot yet be made: a summary of his published writings can be given, and an indication can be added of the high estimation in which he was held by scientific men in these islands. To the foreigners and to men who have not been brought into immediate contact with him his reputation may seem hardly intelligible; and, indeed, we are often constrained to plead guilty to a sort of family affection existing among British Physicists, and a sympathetic understanding running through our appreciation of them, which tempts us occasionally to be unduly inattentive to some of the first-class work of Physicists outside. It is not a fault on which we pride ourselves: it is one which we lament: it is one which may shortly cure itself, as death removes one after another of those countrymen of the last generation whom we have held in such

high honour. The time will doubtless come when, with our eyes opened by bereavement, we can estimate in a manner less hampered by intimate insular knowledge the equal achievements of foreigners; but meanwhile we must plead as excuse the extraordinary personal merit and character of some recent Physicists, notably of FitzGerald, in whom those who knew him best could detect least flaw. But foreigners came under the same influence when they were brought into contact with him, witness Ostwald at Leeds, and Lenard at Liverpool; it may be doubted whether there ever was a man of equal scientific power, agility of thought, and selflessness, combined.

George Francis FitzGerald was born on August 3, 1851, and died on February 22, 1901, before he was 50 years of age.

He was the second son of the Rev. William FitzGerald, D.D., afterwards Lord Bishop of Cork, and later of Killaloe: being at the time Rector of St. Anne's, Dublin. His mother was a sister of Dr. G. Johnstone Stoney, F.R.S. He did not go to school, but was educated at home under stimulating circumstances, and to this fact may be attributed some of the retention of his innate originality.

He was not specially remarkable for early ability, as he did not possess any conspicuous faculty for acquiring languages or other learning involving verbal memory; he was good at arithmetic, algebra, and Euclid, of an inventive turn of mind mechanically, and skilful with his fingers in sewing, knitting, and such work; also he developed considerable athletic powers, though he was never specially competent at games.

While still only 16 he went to Trinity College, Dublin, where he soon took a high place; and on obtaining his degree, in 1871, he won the University Studentship, with two First Senior Moderatorships in Mathematics and Experimental Science.

During six years of post-graduate study for the Fellowship, he laid the foundation of his deep and wide knowledge of Physical Science, by study of the classical writings of some of the Masters in Mathematics and Physics, notably Lagrange, Laplace, Hamilton, and MacCullagh. He also made some study of Metaphysics, and was permanently attracted by the philosophy of Bishop Berkeley.

In 1881 he was elected to the Erasmus Smith Professorship of Natural and Experimental Philosophy, vacant by the death of Prof. Leslie; and work gradually began to accumulate upon him. Fortunately he was able to turn his mind readily and persistently to anything that was brought before him, and in the midst of interruption could sit absorbed in either reading or jotting down calculations, sometimes of considerable complexity. But the leisure for long patient analysis was not his, nor did his genius altogether lie in this direction: he was at his best when, under the stimulus of discussion, his mind teemed with brilliant suggestions, some of which he at once

proceeded to test by rough quantitative calculation, for which he was an adept in discerning the necessary data. The power of grasping instantly all the bearings of a difficult problem was his to an extraordinary degree, and it was rare indeed that a thought or a difficulty could be presented to him over which he had not at some period previously brooded. If it were not so, if the ideas were really then presented for the first time, his quickness in seizing them was miraculous. It is easier to suppose that during his long and strenuous course of reading, and in the stimulating mental atmosphere of Trinity College, in conversation also with his uncle Dr. Johnstone Stoney and others, nearly all the problems in physics likely to occur to contemporaries had in some form or other come within his ken: and hence hardly anything that could be suggested seemed altogether new and strange to him. Nor did his knowledge seem to have sunk into any kind of oblivion; there it was always accessible, and with an added commentary of his own quite ready, to the surprise and delight of those who conversed with him.

So, for instance, occurred his perception of the influence of light-pressure in Astronomy; also of the emission by the Sun of electrified particles which streaming past the earth might give rise to magnetic storms and auroræ, before our knowledge of electrons made this idea easy or quantitatively feasible. So also occurred that brilliant suggestion of the change of shape or distortion due to motion through ether, now known as the FitzGerald-Lorentz hypothesis, which flashed on him in the writer's study at Liverpool as he was discussing the meaning of the Michelson-Morley experiment. Of this nature also was his suggestion to utilise the oscillatory discharge of a Leyden jar as a means of exciting ether waves: an idea which roughly had occurred to others before (the writer finds it in one of his own note-books of date 1879-80), but with FitzGerald it became quickly definite, leading him to investigate not merely the easy problem of the wave-length to be expected, but the much more difficult question of the amount of power that would be radiated by an alternating current in any given case.

Directly Hertz's experiments were published, FitzGerald discerned their whole significance, and in his brilliant Presidential address to Section A of the British Association, at Bath, called the world's attention to them in an unmistakeable manner. Had it not been for the English recognition they received it is improbable that the work of Hertz would have been hailed with the immediate chorus of universal approbation which it commanded, for the work of his own countrymen had mainly lain on other lines; and even to Hertz himself the theory of Clerk Maxwell only gradually, and subsequently to his verifying experiments, became quite clear and familiar. Undoubtedly FitzGerald recognised more vividly than Hertz himself at

that time the full import of his experiments,—the German title of which was far from representing the plain significance of the title applied by Lord Kelvin to the later English translation, viz., “Electric Waves.” This is no disparagement to Hertz: rather it strengthens our admiration of him to perceive how quickly and perfectly he could emancipate himself from national traditions, and constitute himself an apostle, and one of the most powerful exponents, of the Maxwellian Theory of Light.

But to FitzGerald all this was fundamental and familiar—he had got beyond the analysis, and revelled in full-bodied conception and pictorial imagery and mechanical models of what was going on: and these clear perceptions of his, with a realisation of much of the outcome that might be expected, were really of more value and contributed more to the progress of science than did his own laborious analytical investigation of the Electro-magnetic Theory of the Reflexion of Light from insulators, from crystalline bodies, and from magnetised media, which constitutes his chief systematic memoir: powerful and impressive as the complete mathematical analysis of so difficult a subject necessarily was.

Another aspect of the man was his extraordinary and sympathetic critical power. He did not seem to mind reading other people's papers and proofs: entering into their point of view seemed to him to present no difficulty, nor did the immediate correction of blunders into which they might have fallen seem to present any difficulty, or suggest any claim to superiority.

As an ordinary man could correct a schoolboy's sum, or an exercise in simple mechanics or geometry, so he could tackle a difficult Royal Society paper, or a Treatise, say on Thermodynamics or on Physical Chemistry, and point out both the merits and the flaws in it at once. Never was anyone so clear on the subject of the pitfalls which once awaited the unwary chemist or applier of the second law of Thermodynamics to physical and chemical problems. The result being correct, or at least acceptable, it is so easy to bolster it up by a false application of quasi-mathematic or thermodynamic reasoning; but all such fallacies were instantly detected by FitzGerald, and the essential requirements of both reversible and cyclical processes, as the basis of systematic theory, insisted on.

Suggestions for experiment frequently occurred to him, but were seldom carried out with his own apparatus; rather he preferred to hand on both the labour and the honour of an experimental research to some assistant or student, to whose reputation a successful result would make all the difference; and many results obtained by others probably owe their initiation to him.

By reason of these peculiarities of disposition his published

memoirs may not impress foreigners, or those who did not know him, with a proper idea of his real magnitude; but it is probable that they will nevertheless produce a very considerable impression. For so many of his contributions to science were made to the Royal Dublin Society (of which he acted as Secretary from 1881 to 1889) or orally to the British Association, neither of which agencies are specially well adapted for informing the world generally, that to many the memoirs which will shortly be published, under the careful editorship of Dr. Larmor, will be new, and will come as a revelation of solid and industrious work.

Nevertheless, once more it must be said that his wide knowledge, and brilliant speculations based upon that knowledge, were what impressed his friends the most. Sometimes they seemed almost too fanciful, too far-reaching ahead of solid fact, too intangible and fantastic to be attractive; that is the case to some extent, for instance, with parts of the Helmholtz Lecture, where the beauty and the possibilities of the vortex hypothesis of the constitution of matter and of the structure of the ether entice him into regions where substantial mathematical progress is hardly yet possible. Into this region, however, the human race must advance, if it is to proceed with the unification of matter and the more fundamental understanding of the material universe; and our descendants—the possessors of an elaborated theory—will be able to judge better than we can how far these speculations of FitzGerald were fantastic imagination, and how far they were the outcome of a real and semi-inspired insight into the inmost processes of Nature.

But in spite of his ready absorption in these physical topics and his almost unique power of quickly grasping and fruitfully dealing with them, he was imbued with a sense of the far greater importance of humanity itself than of any of these material things. In fact it was this constant feeling of the value of human relationships, and the supreme influence of good feeling and affection, that led him to regard all questions of priority or of scientific credit with not so much disdain as absence of interest. It is easy to say that provided a discovery is made it matters little who makes it, but it is not so easy constantly and consistently to feel and act in that spirit; but so far as it can be done FitzGerald did it, and did it apparently almost without an effort. The things he really valued were the things belonging to the human spirit—the development of the individual and the development of the race. Any thing which hindered this met with his strenuous opposition: self-satisfied unprogressiveness in educational matters excited his wrathful and outspoken indignation: and on these subjects alone did he occasionally make enemies. Other things might be of intense interest but were not of supreme value

and to sacrifice any personal relationship to them was worse than useless.

With all his critical power he seldom expressed himself severely on the scientific mistakes of others. I have once or twice heard him speak of some man as small or narrow, and I have heard him wax indignant over some charlatan who pretended to be what he was not; but these were exceptional instances, and as a rule this mood had to be worked up by others: it did not arrive spontaneously. Generally he saw the best in people; and, like Lord Kelvin, was able to disentangle ideas of value from the crude efforts at presentation of a beginner or of an ordinary muddle-headed man.

Gradually as he grew older the sense of public duty grew upon him, and he was prepared to spend his time in public service to an extraordinary, and as some thought a wasteful, extent. In 1888 he was appointed a member of the Board of Irish National Education, and devoted a large amount of time to work not free from controversy; and shortly before his death he was appointed, with five others, to the Intermediate Education Board. Had he lived (he has written to his uncle, Dr. Johnstone Stoney) he would have sought to devote himself to the organisation of National Education rather than to the uninterrupted pursuit of his science,—saying with complete sincerity that whether the human race got to know about the ether now or fifty years hence was a small matter, but whether the present state of appalling scientific ignorance was to continue for another generation was a vital matter affecting the future of his own country in a positive and definite way.

The portentous backwardness of this country (not Ireland alone) in education does indeed call for sacrifice on the part of those who clearly realise it; and into this work FitzGerald would undoubtedly have thrown himself. Until a general level of scientific knowledge has been attained by a nation, it cannot expect its great men to forge on ahead and continue their advanced studies with satisfaction to themselves. Already they have been feeling too isolated and aloof from humanity, and a feeling of the futility of it all, based upon the entire uncomprehension of the multitude—an uncomprehension shared under our present system of education by the great bulk of so-called educated men,—is apt to make itself unpleasantly prominent every now and then, and to lead gradually to the belief, at which FitzGerald arrived, that greater service could be done by working towards the raising of the general level than by a pioneering quest, solitary or with only a few like-minded spirits, into lands too far removed from human traffic to be capable of utilisation and absorption for generations to come; perhaps, therefore, to be forgotten and ignored altogether, until re-discovered independently hereafter, at a time when the general level of intelligence in scientific

directions shall be higher than it is now, and can enable it to be appreciated and retained.

The authorities of Trinity College, Dublin, are bringing out a memorial edition of FitzGerald's writings, under the supervision and editorship of his friend and equal, Dr. Joseph Larmor; who has likewise written a powerful general summary and estimate of his scientific work, so far as it can yet be estimated, for the *Physical Review* for May, 1901; which will be reprinted with notes and additions in the volume of FitzGerald's collected works. To this memoir the student of advanced Mathematical and Physical science is referred. It is thought better to restrict this present notice to matters of more general interest, but it may be permissible to conclude with a few quotations from the pen of some of his contemporaries, Heaviside, Ramsay, and others, which appeared at greater length in the pages of *Nature* for March 7, 1901:—

“At the last meeting of the British Association (at Bradford, 1900) the proceedings of the Physical Section were interesting and successful from one cause beyond all others—the assiduity with which he devoted himself to attendance, and the unceasing flow of valuable suggestion and appreciative criticism which he contributed. His stores of knowledge were ripening and maturing in fibre year by year; his memory was unfailing, and each new fact or phenomenon seemed to find its place at once in the setting to which it belonged. Whatever views were presented to him, however much they jarred with his own ideas, were certain to receive patient and careful consideration. There was nobody who did more to encourage younger men and to bring out what was best in them; the time which he was accustomed to devote without stint to the elucidation and improvement of the work of others sadly diminished the opportunities for work more especially his own. His advice and judgment were valued over the whole range of Physical science, not less in foreign lands than at home, notwithstanding that he published so little. When a Physicist or physical Chemist came to a puzzle or paradox, or was in doubt between various plans of procedure, it seems to have come to be almost the natural course to write to FitzGerald. A letter of inquiry or criticism always elicited a prompt reply, entirely devoid of pretension to magisterial authority, but certain to bring out new aspects of the subject and exhibit its connection with other problems. He was constantly acting as referee of scientific papers for the Royal Society and other bodies, and was accustomed to interest himself in them as if they were his own work.”

J. L.

“He had, undoubtedly, the quickest and most original brain of anybody. That was a great distinction; but it was, I think, a misfortune as regards his scientific fame. He saw too many openings.

His brain was too fertile and inventive. If he had been less quick and versatile and more plodding he would have been better appreciated, save by a few." O. H.

"FitzGerald had no trace of intellectual pride, he never put himself forward, and had no desire for fame; he was content to do his duty. And he took this to be the task of helping others to do theirs. Although he held strong views on many points, and could defend them with vehemence, his argument was never a personal one; and it was obvious that he was actuated solely by a love of truth, and that his only object was to defend what he thought to be right. Moreover, what FitzGerald thought to be right was pretty sure to turn out to be right in the long run." W. R.

From an obituary notice in the *Electrician* for March 1, 1901, the following:—

"He possessed extraordinary versatility, and could turn his mind almost instantly to anything, but the instant it was so turned it went deep into the subject, to the exclusion of other things for the moment; and in the deepest subjects he was more at home than in the trivial and superficial. But he was never a recluse; had he been more of a recluse perhaps his great power of intimate brooding and absorption, combined with his wide mathematical knowledge and preparedness, might have led him to some epoch-making discovery. But if so he did not give himself the chance, his place was with the captains and the shouting, and the intervals of leisure for real continuous work were few and far between." O. J. L.

A communication from Lord Kelvin, which appears as the conclusion of Dr. Larmor's memoir above referred to, shall not have an extract removed from the context.

But on the personal side, the following extract from an appreciation in the *Athenæum*, attributed with some probability to Professor Mahaffy, may be quoted:—

"His appearance was not unworthy of his fame. More striking he was than handsome; but his ample grey locks and beard, his furrowed brow, his penetrating eyes, reminded one of the bust of some Greek philosopher, which we cannot look upon without that instinctive feeling of respect which intellect and character command among civilised men."

And the following by Larmor:—

"His scientific place will be henceforth alongside Rowan Hamilton and MacCullagh and Humphrey Lloyd, and the other famous men who have secured for the Dublin school so prominent a position in the edifice of modern physical science. In the higher domain of heart and conduct the recollection of his qualities will be an abiding treasure to all who knew him."

FitzGerald was elected a Fellow of the Royal Society in 1883, and in 1899 was awarded a Royal Medal. He married, in 1885, Harriette M., second daughter of the late Rev. J. H. Jellett, D.D., Provost of Trinity College, Dublin, to whom the next previous award to an Irish man of Science of a Royal Medal had been made. One who had unrivalled opportunities of appreciating these two men remarks on "the great likeness in the two characters: the great simplicity, the directness of purpose, the utter absence of preaching but the living of the life that is best; their great tenderness and love of children."

The "idealistic" turn of his mind in dealing with ultimate questions came out constantly in his conversation on such topics, and may be illustrated by a quotation from the end of his Helmholtz Lecture. After noting that all forms of external stimulus, into whatever terms we translate them—sound, colour, and the rest, nay, even space, time, and substance too, perhaps—resolve themselves into motion, he goes on to ask: "And what is the inner aspect of motion? In the only place where we can hope to answer this question, in our brains, thought [turns out to be] the internal aspect of motion. Is it not reasonable to hold, with the great and good Bishop Berkeley, that thought underlies all motion" "For the highest life we require the highest ideal of the Universe to work in. Can any higher exist than that, as language is a motion expressing to others our thoughts, so Nature is a language expressing thoughts, if we learn but to read them."

He insisted on the ether being not a simple fluid, with the atoms as vortex rings, but a medium itself full of motion,—a vortex "sponge" or assemblage of vortex filaments; and by help of such a medium he hoped ultimately to be able to explain not only light and electricity but the structure and properties of matter, all its physical and chemical agencies, and the material universe generally. But always he was well aware that such would be no ultimate explanation, that what we are really and primarily aware of is mind and mental processes, that thought and feeling are primary facts of consciousness, while all else is an inference and is probably essentially unlike what it appears to our senses: so that all this cosmic whirl and material activity, and probably life itself, would resolve itself, when properly comprehended, into the activity of an all-pervading and beneficent Mind.

O. J. L.

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